

Faunal evidence for prehistoric economy and
settlement in the Outer Hebrides to c.400 AD.

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DECLARATION.

The research for and presentation of this
study are entirely my own work.

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ABSTRACT

The aim of the research was to examine the evidence for prehistoric settlement and economy in the Outer Hebrides as revealed primarily through study of the animal bones recovered from excavations in the area. To this end identification and analysis were carried out on faunal material from several important sites in the area, dating from the Neolithic through to the immediately post-wheelhouse Iron Age phases, and the results were compared and contrasted.

The main body of the text divides into three sections, after a general Introduction. Section I provides a background to the study and outlines the current state of knowledge regarding the settlement prehistory of the area, noting an imbalance in distribution of site type and period. The physical characteristics of the islands are described briefly, to indicate the environmental conditions under which settlement took place. In the final portion of section I consideration is given to the methods and techniques of faunal analysis applied to the material under study, and the relative merits or demerits of each in relation to small-scale prehistoric assemblages are outlined.

In Section II the economies of the sites studied are considered individually and a general picture of each is given.

In the first part of Section III the species represented throughout the sites, both domesticated stock and wild resources, are considered, in order to give some idea of the characteristics, availability and potential value of each species represented in the archaeological record. The fauna show little change in type or character of species throughout, with stock introduced after domestication and with wild species similar to those available today. The results of the individual site studies are then collated into a discussion of the general trends of agriculture and animal husbandry in the prehistoric period in the Outer Hebrides, as far as can be discerned from the information currently available. Pertinent evidence of a non-faunal nature is included in the discussion where appropriate, to broaden the scope of the study to a full assessment of economic practice. Based on all the available information a picture emerges of stable human groups, slowly evolving a system of mixed farming and settlement in response to their environment.

The main body of the text closes with a Prospect where suggestions for future research, both in the field and the laboratory, are given, prompted by the problems and imbalances noted in this study.

Identification, measurements and bone abnormalities of the faunal material studied are included in Appendix form at the end of the work.

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Introduction.

While working on the faunal material from the Wheelhouse site at Cnoc Sligeach, Sollas, North Uist for an Undergraduate Dissertation, I became increasingly aware that very little information was readily available about the faunal remains from prehistoric sites in the Outer Hebrides of Scotland. The only remnants of the numerous "investigations" of the Nineteenth and early Twentieth Centuries are a few fragments in museums and these contribute nothing at all to our understanding of the sites. In the middle of the present Century several sites were excavated in the area (notably the Rocket Range excavations on the west coast of the Outer Hebrides in the late 1950s and early 1960s) but few ever reached publication. The past two decades have seen the excavation of a few important prehistoric sites in the area, particularly the Udal, North Uist; Northton, Harris; and Rosinish, Benbecula. These sites are important not only because of the more sophisticated techniques of excavation and post-excavation work available, but also because they contain pre-Iron Age settlements for which we have otherwise little evidence. The Udal also spans a considerable time range and can act as a framework into which the single period sites may be fitted, particularly since it furnishes a

series of radio-carbon dates, which is not the case for most of the sites.

For the purpose of this thesis, research was undertaken to assemble the available information pertaining to fauna from relevant sites for presentation as a definitive corpus, readily accessible for future study. As a result of this work, an attempt has been made to assess any changes in the economic situations of the area as a whole, with regard to chronological progression and geographical location, drawing on not only the faunal evidence but also the information available through study of the structures themselves and the associated material culture. Throughout this study "prehistoric" will indicate the traditional periods from the "Neolithic" through to the "Late Iron age": ie. from about 3,500 B.C. to about 400 A.D., although radiocarbon dates from the Udal (North Uist) argue for a considerably earlier dating for the upper end of the range. The "Three Age" system will be used in broad contexts for inter-site correlation, but greater contextual division will be indicated where appropriate within the individual chapters. Deposits of mixed or uncertain origin are, in principle, not considered for analysis, but in practice such a distinction is not possible for some of the sites where the total assemblage has had to be considered as a unit. In such cases, the material has merely been identified and no attempt at analysis of any sort has been made. In almost all cases, the sites have been subjected to disturbance by rabbits and their remains have been ignored in the faunal analyses. At the Udal, rabbit intrusion did not seem to have greatly mixed the deposits, except in a few cases where

the material has been recorded as coming from a mixed context and treated accordingly. The term "Outer Hebrides" will refer to the islands of Lewis and Harris, North Uist, Benbecula, South Uist and Barra, including the smaller islands which lie between and around these.

SECTION I. Background to the study.

Chapter 1.

Prehistoric activity in the Outer Hebrides.

Evidence of prehistoric activity in the Outer Hebrides is widespread but unevenly distributed in terms of chronological period and site type. Many known sites remain undated through lack of excavation, others have suffered from 'investigations' which have effectively limited archaeological knowledge of dating and context, and some have been particularly noted due to their form or location. One of the most striking examples of this is in the Neolithic period which is represented by abundant funerary evidence in the form of at least 44 monuments (Henshall 1972) while settlement is so far known from only three rather ephemeral sites (Fig. 1): the Udal (N. Uist), Northton (Harris) and Eilean an Tighe (N. Uist) and no faunal remains are extant from the latter. Henshall (1972) deduced from the available evidence that "the cairn builders were not especially interested in the machair", that they preferred the good upland pastures where most of the cairns are situated, and that the Neolithic settlements were likely to have been in the immediate vicinity of the monuments. However, as Crawford (1978) points out, this argument is not consistent with the environmental conditions, with archaeological comparison or with the little direct archaeological evidence

available. From the Early Bronze Age onwards settlement density on the machair becomes more tangible and the number of sites visible from later prehistoric periods is considerable, although few have been excavated or precisely dated.

The reasons for the uneven representation of prehistoric sites and monuments is partly one of excavation choice; thus the most structurally obvious sites in easily accessible places have been dug - mainly Iron Age Wheelhouses on the machairs and Neolithic megaliths on the peatlands. Virtually no evidence for Mesolithic occupation has been discovered in the Outer Hebrides and this, coupled with the scarcity of Neolithic habitations on the machair where settlement has been concentrated ever since, are attributable to a rise in sea-level and deflation of the earlier machair deposits on the west coast of the Outer Hebrides, which has probably destroyed most of the Mesolithic and Neolithic areas (this point will be further expanded in Chpt.2). Certainly, from that period, settlement has gradually moved back towards the edge of the moors where most of the townships now lie (Crawford 1978). The sea-level rise was followed by coastal rearrangement which has eroded much of the Bronze Age landscape and seems to have reached a point today where the Beaker settlement zone lies in danger of shore-face erosion. Finally, wind deflation has redistributed much of the Iron Age machairs.

Modern man has also played a major part in the destruction of evidence of prehistoric settlement in the Isles: not least the well meaning excavators of the late 19th and early 20th Centuries who,

while laudable in their interest in prehistoric man, failed to preserve much of the evidence which they uncovered - notably faunal remains. Less scholastic intentions prompted the removal of stones from prehistoric buildings to build new outhouses, cottages and the like, and the remaining structures often formed snug enclosures into which the local herder could dig himself a shelter. The burrowing of rabbits riddles archaeological sites, mixing deposits and opening up the area to erosion by aeolian forces. The overgrazing of sheep has likewise affected the stability of the machair landform.

With these limitations in mind, what evidence is there for economy and settlement in the Outer Hebrides in Prehistory? For the Neolithic period there are faunal remains extant from the Udal in North Uist and from Northton in Harris (Fig. 1); Beaker settlements at Northton and at Rosinish in Benbecula (Fig. 2); and Iron Age material from the Udal, Northton, the Drimore sites in South Uist, the Balivanich sites in Benbecula, and various small scale excavations in South Uist (Fig. 3). The site of Barvas and Dalmore in Lewis have recently been excavated but information is not yet available and they have been disregarded in the Neolithic and Beaker analyses. It must be noted that the Udal gives a complete chronological sequence but, due to the necessity of switching from a research programme to one of a rescue nature, the continuous development of the excavations have been interrupted. Thus the Bronze Age layers lie largely unexcavated (and therefore relatively protected) while rescue of the Neolithic site has priority, and research into the Iron Age structures continues slowly.

It is not proposed to analyse the structural form and cultural assemblage of each site in detail since it is felt that this is outside the scope of this thesis: such information can be derived elsewhere from the relevant site reports or publications. Where appropriate a brief outline of the various features at a site will be given within the chapter dealing with that site, relating to the associated faunal material, and relevant structural features will be discussed in Chapter 12. However, since almost all of the Iron Age sites mentioned here are wheelhouses (mainly because few duns have been scientifically excavated on the islands), a general note on this structural form seems appropriate here. A wheelhouse has been defined as

"a circular space...enclosed by a dry-stone wall and divided into wedge-shaped compartments by short walls which lie radially, but which do not start from the centre and do not reach the circumference. The spaces between the outer ends of these radial walls have been left open, so that each compartment is directly accessible from the surrounding passageway. The spaces between the inner ends, on the other hand, have usually, though not always, been built up, leaving a central space where there has been a hearth and which has possibly been left open to the sky. The compartments formed by the radial walls have been made into little chambers by being roofed over with lintel stones."

(RCAMS 1928 p.xlii)

It is interesting to note that, more than half a century later, we have very little to alter in this description, except that roofing of the chambers need not be only by lintelling, and that the "aisles" may be blocked during building or during subsequent use. In addition, we can add that a complex entrance passage seems standard, that a souterrain is often present as an integral part of the structure, and that certain (although varying) "ritual" features may be uncovered through excavation of the floors.

In an attempt to consolidate and analyse all of the existing information regarding wheelhouses, the present writer has undertaken a detailed study of the structures, collating the available data gleaned from excavation and field observation. It is hoped eventually to publish this as a separate study and since full details have not yet become available regarding the structures at Sollas and the Udal, only tentative deductions can be drawn here. The study is based on the following sites (Fig. 3):

the Udal, North Uist

Sollas, North Uist

A'Cheardach Bheag, South Uist

A'Cheardach Mhor, South Uist

Kilpheder, South Uist

Bruach Ban/Bruach a Tuath, Benbecula

Cnoc a Comhdhalach, North Uist

Bac Mhic Connain, North Uist

Calternish, South Uist

Usinish, South Uist

Tigh Talamhanta, Barra

Clettraval, North Uist

Garry Iochdrach, North Uist

In the past there has been a tacit recognition of a sub-division within the structural class into 'wheelhouses' which are machair located, and 'aisled roundhouses' which are situated on higher ground and are more massive in construction. The latter feature is taken to be a response to the more exposed location of the 'aisled roundhouses' and to their construction as free-standing structures, as opposed to the siting of 'wheelhouses' which appear to have been dug into sand or midden. For the 'wheelhouse' group, the evidence so far suggests that two buildings may generally be associated at a site; a smaller diameter structure (c.17-24 feet in internal diameter) may predate a larger building (c.26-40 feet) close by. At Sollas the smaller building may have been robbed out to build the larger, and there is no evidence of contemporary usage: at the Udal, however, the smaller and earlier wheelhouse seems to have been re-used during the period of occupation of the larger edifice: at A'Cheardach Bheag the two are joined by a passage. The main entrance to the wheelhouse usually faces east (presumably in response to the direction of the prevailing wind) and one or two cells are frequently located within the walls of the entrance passage. Later additions or alterations to the main buildings are generally known where excavation was conducted, and it is tantalizing to reflect that the apparent "squatter" situation at

the Udal (where modification of the wheelhouse interior and construction of a souterrain immediately post-dates the end of the "wheelhouse" phase) may be present elsewhere but have not been discerned in the course of less scientific excavation in the past. The larger wheelhouses seem to be divided into between 10 and 13 bays, the smaller buildings into 6- 10 bays. On the whole the bays seem to have been roofed by corbelling or lintelling but no definite evidence exists for upright supports for the central area which is too wide a span for either corbelling or lintelling. All known forms of construction of the radial piers are represented within the group: freestanding, built into the peripheral wall, and lintelled into it. Three examples of clay used as a "mortar" have been recorded. Wall recesses are an integral part of the construction, and two examples of "slab seats" are known: one or more hearths are usually situated in the central area, either bordered by flat stones or with post-holes around it. Evidence of "ritual" activity is seen at most of the excavated sites, usually in the form of animal bone of a particular character or arrangement.

Until the information from Sollas and the Udal is assimilated, evidence for functional differentiation between the individual cells within a wheelhouse can be purely conjecture, since so few have been excavated to the extent of, say, lifting the floor(s). There is some suggestion that there may be kerbing around the inner end of the bays on the opposite side of the building to the doorway. Some specialization of function is indicated in the bays of the excavated wheelhouses, such as pottery concentrations, "ritual" pits containing

animal teeth or beach pebbles etc., or patches of burning. Eventually a break-down of the animal bone from each bay and from the central area should be possible for Sollas and perhaps for the Udal too, although the "squatter" material there causes problems of excavation and analysis of "wheelhouse" material alone. 'Aisled roundhouses' contain many of the same internal features as the other group, but externally they appear to differ in form. This point will be expanded in Chapter 12. All of the excavated sites show evidence for iron or bronze working on site, in the form of slag, crucibles or mould fragments.

This class of monument has its greatest concentration on the machair plains of North and South Uist and in Benbecula, but examples of similar forms of building (and here it must be stressed that we are referring solely to a construction technique) are represented at Clickhimin and Jarlshof in Shetland, and on high ground in Caithness and Sutherland. Wheelhouses are generally considered to be "Iron Age", exhibiting elements of a shared material culture with brochs and duns, and dated to the early centuries AD.

A brief note must likewise be made regarding the structure of duns in the Outer Hebrides since, although no faunal remains from duns have been identified specifically for this thesis, identification of the bone from Dun Cuier, Barra (Young, 1955-6) will be used for comparative purposes. In general duns can be described as small forts, usually sub-circular or oval, with a single stout wall of dry-stone masonry enclosing an area seldom exceeding 375 square metres.

The enclosing wall consists of a solid rubble core between dry-stone facings, occasionally with a timber-laced structure, and the entrance passage is generally checked, with bar-holes for a wooden door. Features such as galleried construction, intramural cells, stairways and the door arrangement previously described suggest a related building tradition to that of the brochs. Scanty evidence suggests timber ranges against the inner wall face as internal features. Some of the smallest duns, especially the very regular examples in Uist, may have been completely roofed and appear to be fortified individual houses, not farmsteads as the larger examples are suggested to be.

Duns are not necessarily located in naturally defensible positions, and in Uist particularly, many are built on islets in small lochs connected to the shore by a causeway. Dating of these structures is uncertain due to a lack of modern excavation but it is thought that they may have been built from the Sixth Century BC to the middle of the First Millennium AD: several show signs of reoccupation after a period of abandonment. Dun Cuier, of which further mention will be made in Chapter 11, is a small galleried dun in Barra, and its construction and occupation debris have been dated to the mid-First Millennium AD.

Brochs will not be discussed in this thesis, partly because there are no faunal remains from any brochs in the Outer Hebrides, and partly because it is felt that, whereas many duns can be seen as defended homesteads, brochs have an unequivocally defensive construction and imply social co-operation in the building, and are

therefore outside the scope of the present work. In addition, the inclusion of brochs from a wider geographical area in the research would have rendered the topic unmanageable in size and it was decided to exclude them.

Considerable difficulty was experienced in locating faunal and/or contextual information about several of the "Rocket Range" sites under consideration and much relevant detail has still not been recovered. The identification of bones from these sites has been listed in Appendix 3, in order to make this material accessible for further research. The detailed identification of the fauna from Sollas and Northton has likewise been included in Appendix 3, since only a summarized listing in tabular and discussion form will appear in the excavation publications. The material from Rosinish has not been listed, mainly due to the hurried manner in which it had to be examined. The Udal bone has also been excluded, since work on the faunal assemblages from the site is far from complete and the inclusion of the Udal prehistoric bone in this thesis must be considered only as a preliminary evaluation of the economy of the site: it is hoped that the completed analysis will eventually be published within the excavation report. In addition to the evidence gained from the material specifically identified for this thesis, published (and often, unfortunately, inadequate) faunal reports from other sites in the area will be used for comparison where possible, as will suitable material from comparable sites further afield.

The greatest problem found in the faunal analysis of sites in the Western Isles has been not so much the lack of actual material, as the lack of contextual and stratigraphic information about the sites themselves. The chapters within this thesis in which reports on the individual sites are discussed vary widely in both quality and quantity, reflecting the standard of not merely the excavation, but also of the recording and preserving of material and data to enable fresh analyses and interpretation to be undertaken. It will be found that some particular aspect may be dealt with at length in one chapter and virtually ignored in another: this is due to the lack of information regarding that aspect at the second site. This uneven representation has made overall interpretation more difficult than it might be but, all in all, it is felt that a wide-ranging view of the economic situation in the Outer Hebrides in Prehistory has been achieved.

Chapter 2.

Physical characteristics of the Outer Hebrides.

The islands of the Outer Hebrides lie off the North-West coast of Scotland, separated from Skye and the mainland by the waters of the Minch. The group can be divided into two parts on a topographical basis: Barra and the 'Long Island' (South Uist, Benbecula and North Uist) are predominantly low-lying with hills along the eastern margin: Lewis and Harris are mainly upland, with only small areas of lower ground (Fig.4).

Most of the sites with which I shall be dealing are concentrated on the machair plains of the west coast of the 'Long Island', an uneven strip of calcareous shell sand, varying in width from 2m to 2km, bounded to the west by coastal dunes bordering the Atlantic Ocean, and rising in the east to an undulating peat upland with many lochs and bare rock outcrops: a thin belt of alkaline loams or thin 'black' soils lies between the machair and the hill land (or 'Black Lands'). Drainage, acidity and low fertility are problems on the peaty soils of the uplands, while the dunes and machair areas have soils which vary in drainage from excessively free to excessively wet (Glentworth, 1979): the 'black' loams represent a transition zone

where blown sand reduces the effect of acid peat soil. From historic times to the present day (Grant, 1979) the agriculture of the Uists has been heavily dependent on the machair lands, where the distinctive ecological elements of calcareous sand and an oceanic climate have combined to give a lime-rich but unstable habitat in which the greatly enriched machair vegetation develops (Dickinson and Randall, 1979). However, this land is not easy to work (Grant, 1979) for it is alkaline with pH values above the optimum for most crops; it has major deficiencies of nitrogen, phosphorus, potash, copper and manganese. Organic matter content is low, giving poor water holding qualities to the soil and thus, since rainfall is comparatively light, even short periods of dry weather can lead to drought. Little natural shelter is available and the land is exposed to persistent south-west winds, often resulting in severe 'blasting' of plant growth and in the encroachment of coastal dunes. Nevertheless, the machair lands today, managed mainly under the crofting system of agriculture, adequately bear arable crops of hay, wheat, barley, oats and potatoes, and/or provide pasture, while the peaty uplands are grazed by sheep.

The questions of development and destruction of the machair landforms, and of marine transgressions affecting the west coast of the Outer Hebrides in the Flandrian period have been comprehensively considered, both from a geomorphological point of view by Ritchie (1966a, 1966b, 1971, 1972, 1974, 1976, 1979) and from an archaeological one by Crawford (1978). It is proposed only to provide a brief outline here of the principles and forces involved, in order to give some understanding of the nature of the topography in which

most of the sites under consideration are located. Between c.10,000 and 4,000 BC massive deposits of comminuted marine shell lying on the continental shelf were pushed eastwards by the Flandrian eustatic rise and were ultimately admixed with silicious elements and lodged on suitably graded rock shelves on the Western Scottish coastlines. Subsequent modification by aeolian forces and coastal change produced the present machair landforms, as a result of the procedure seen by Crawford (1978) as "a great belt of machair material moving slowly, throughout the five millennia of the Boreal and Atlantic periods, up the gradual gradient of the Outer Isles gneiss ramp, impelled by rising sea levels, with doubtless wind reformation playing a secondary role." It seems most likely that the Neolithic machair (and any accompanying traces of human activity) was removed by the coastal modifications which followed the end of eustatic rise (c.4,500 BC) and which have continued, decreasingly, since. The Beaker and Bronze Age machairs are still evident, but badly damaged through the continuous process of erosion and deposition which has in turn created the Iron Age, Medieval and modern landforms.

In contrast to the islands to the south, Lewis and Harris are mainly composed of hills and low peat lands, with a few sandy beaches on the west side. South Harris, where the site of Northton is located, is much more sheltered, with gentler land and a milder climate. The entire west side is a chain of 8 sandy beaches, divided by rocky spurs: every beach is backed by machair leading on to the grassy hills behind. The east coast of South Harris continues the topography further north with bare rock outcrops indented by many bays. As on

the Long Island, the machair areas of the west are cultivated while the more barren areas of the east and centre give grazing for cattle and sheep, and tillage is possible with the development of lazybeds built up on the rocks.

The climate in the Outer Hebrides today is characterized by a mean summer temperature of 55-56°F, that is 1°F higher than Scotland's east coast, and a mean winter temperature of 41-42°F -some 3° F higher than the east coast. These mild conditions are caused by the North Atlantic Drift of the Gulf Stream, prevailing westerlies and the small size of the islands. Precipitation on the islands is 40-60" annually, slightly greater on the mountains of Harris. The outstanding climatic feature of the Outer Hebrides is the strong and persistent wind which blows the rain clouds across the low islands to precipitate mainly on the Highlands. Thus the islands have long hours of sunshine, especially in April, May and June.

Controversy has raged over whether the upland areas of the Outer Hebrides were afforested during prehistoric times, a matter of obvious importance to the archaeologist, affecting our conception of the supplies of timber available then, and the resultant effect on our interpretation of economy and material culture. The few palynological studies of Flandrian vegetation in the Outer Hebrides show very high frequencies of non-arboreal pollen and suggest that there was no extensive forest cover on the islands during the Flandrian period. The pollen analysis of Birks and Madsen (1979) for Little Loch Roag, Lewis supports a view of a predominantly treeless landscape with

scattered birch copses in locally favourable situations. Today Red Deer herds still occupy the high moorlands of the interior of North Uist and Harris, and the freshwater lochs of the uplands contain species of fish present since the last glaciation, unaffected by the introduction of alien species (Campbell and Williamson, 1979). Marine resources too are extensive and impressive, comprising seals, on-shore and off-shore species of fish, and a wide variety of mollusca and crustacea (Bailey, Hislop and Mason, 1979). There is also a staggering variety of coastal and inland bird species represented on the islands. All of the available wild life resources today are generally assumed to have changed little since late prehistoric times.

Chapter 3.

Methods and techniques.

Before discussing the results of the identification and analysis of the faunal remains from the various sites under consideration, it is necessary to briefly outline the methods and principals by which the work was conducted, in order that comparisons with the results of other studies may be made in the light of the level and complexity of study, and the detailed techniques employed. Unless otherwise noted, all identification and analysis was done by myself, under the principles and methods outlined below. Where the bones from any site have already been classified by another worker, note will be made and their results used as they stand; where I have added further analysis, this will be stated. All the faunal remains were identified through the use of modern comparative material, textbooks of comparative anatomy and the generous aid of a number of people, thanked individually in the acknowledgments. Bones were identified with regard to species, anatomical element, position left or right of the axial skeleton, state of epiphyseal fusion, and the stage reached in the sequence of tooth eruption and replacement at death. On the whole, ribs and vertebrae have not been identified as to species, since the value of the results so obtained does not generally justify

the time and effort involved. Owing to certain shortcomings in the bird reference collection used, it has frequently not been possible to do more than indicate the nearest identification found among the reference material, but at least this will indicate the size and type of bird represented. The fish bone has been identified by myself, by Ms. S. Colley (Faunal Remains Project, Southampton) and by Mr. D. Henderson (Dept. Archaeology, University of Edinburgh).

Detailed identification of the bulk of the faunal material under study is contained in Appendix 3; the bones from Rosinish have not been listed as they were not subjected to a sufficiently thorough examination. The Udal material has also been excluded, since the intention is eventually to amass the identifications from the full chronological range at the site and to make it accessible on computer.

Measurements of the bones were taken where possible, following the standardized scheme of von den Driesch (1976), and care was taken to measure only bones of mature animals which showed no signs of erosion at the points of measurement: burnt and chewed bones, along with those showing any abnormality, were not measured. Metrical analysis was undertaken for two purposes: to attempt to differentiate between species, type and sex; and to assess the size and quality of the main food animals and to note any variation over the time span under consideration. Measurements were statistically analysed but due to the small size of the sample available the results were statistically insignificant and are not reproduced in this thesis. All measurements are summarized in Appendix 2.

Recovery methods can considerably affect the nature of the faunal assemblage for study, as Payne (1972a) has shown. Unsieved samples tend to be biased towards the larger mammals, as smaller bones are easily overlooked in hand excavation. It must be noted that an imbalance exists within the total faunal assemblage considered in this thesis since most of the sites were excavated as rescue projects in advance of the planned rocket range construction and sieving was not carried out. At the Udal, however, dry-sieving is standard for all deposits, and wet-sieving is carried out on a sample basis. From personal experience it has been noted how often fish, bird and small mammal bones, and the smaller bones of larger mammals are recovered in the sieves, rather than in the process of careful hand- trowelling. It must therefore be assumed that there will be a heavy under- representation of the smaller bones from the unsieved sites, and inter- site analysis must be conducted with caution.

Various methods of estimating the age/sex ratios of the faunal populations at the sites have been tried but the applicability of each method varies according to the nature of the site and the size of the recovered assemblage. Evidence for determining the sex of animals represented by archaeological material may consist of morphological differences between the sexes, but in many cases the size and proportions of the bones may be the only criteria by which the sexes may be distinguished. The faunal material in this study was considered in this manner but the samples are too small to be valid in a statistical sense and the results were inconclusive (Figs. 5-13). It is also possible to estimate the sex of animals by the

calculation of various indices which are known to have a diagnostic value, but the calculations involved are complex and their empirical base not without question. One line of study which shows promise aims to develop standardized schemes of horn-core morphology for cattle (eg. Armitage and Clutton-Brock, 1976; Grigson, 1982a; Armitage, 1982), distinguishing between cows, bulls and castrates as far as possible. Unfortunately, the few horn-core remains from the Outer Hebrides are mainly fragmentary and such schemes have proved of limited application in this particular study. All of the available sexing methods are really only suitable for large quantities of well-preserved bone, as they are essentially comparative.

An estimation of the age of an animal at death can provide the basis for consideration of several aspects of the economy of a site, giving information about hunting/herding patterns, dietary preferences and ecological background. The main methods employed in the retrieval of such data are the study of epiphyseal fusion (eg. Silver, 1969; Bull and Payne, 1982; Bullock and Rackham, 1982), the sequence of tooth eruption and replacement (eg. Silver, 1969; Andrews, 1982), the degree of tooth wear (eg. Grant, 1978; Grant, 1982) and the interpretation of periodic incremental structures in teeth (see Stallibrass, 1982 for review and extensive bibliography of this topic). Most of these lines of research have been applied to the material under consideration, with the exception of the study of incremental structures. Despite a preliminary investigation into the technique as part of my Undergraduate Dissertation (Finlay, 1981), it was not possible to gain further access to the necessary equipment and

materials to extend this work. Tooth wear analysis was considered using the schemes proposed by Payne (1973) and Grant (1975) but the results only served to augment the tooth eruption data and could not be analysed independently, owing to the small numbers of mandibles available. The results of these analyses on the material from the Outer Hebrides are discussed in the individual site chapters and in Chapter 11. The main problem with all of the available methods of ageing and sexing faunal remains is that they are relative, not absolute, and must therefore be established for each species and location. To date, no comparative studies of this nature have been conducted using the 'unimproved' breeds under the nutritional conditions naturally prevalent in the Outer Hebrides and, as a result, any suggestions of ageing of the fauna represented in this thesis must be accepted as part of an overall scheme of relative values, not as individually absolute figures. There is a great need for work on tooth eruption and wear and epiphyseal fusion to be conducted on a local basis to enable a more realistic assessment of the animal populations in the Outer Hebrides in prehistory to be made.

The quantifying of animal bones from archaeological contexts is, without doubt, the most hotly debated topic in Archaeozoology, simply because no single method is adequate to cope with the limitations inherent in all archaeological material. The main methods which have been proposed are:

a. "Fragments" method - this involves counting the total number of identified fragments for each species and comparing them to give relative values for the species represented at a site or context. The

problem is that the recovery rate will vary according to species, to variation in identifiability between different bones, to biases due to preservation or butchery patterns, and to the fact that large bones tend to be broken into smaller parts, thereby giving more fragments per bone (eg. Clason, 1972a).

b. "Minimum Number of Individuals" - there are many ways of calculating the MNI, varying in complexity of method from counting the most frequently represented skeletal element, to various formulae, most of which have been proved invalid. In general, MNI estimation is only applicable for very large samples and even then it is much weakened by the existence of so many unknown variables pertaining to it (eg. Krantz, 1968; Chaplin, 1971; Perkins, 1972).

c. "Weigemethode" or weight method - this system expresses the relative representation of taxa in terms of the difference in meat weight, the comparative figures being derived through formulae applied to bone size and quantity. Control experiments have shown that it has an unsound logical and empirical base and there seems little justification for its use (eg. Kubasiewicz, 1956; Uerpmann, 1971).

Having tested these methods on varying material, my own feeling is that, with the small assemblages generally available from the Outer Hebrides, it is better to concentrate on comparative study of a series of sites than to over-exploit the data obtained from a single site by sophisticated techniques of quantification. For the main sites analysed in this thesis MNI calculations have been made by counting the most frequently represented anatomical element, taking into account the factors of age, size and left/right. The only exceptions to this are Sollas 'B' where individual pits contained whole skeletons

or articulated limbs. Quantification of the bones under study is discussed in the individual chapters and expressed in tabular form..

The problem with all the methods of quantifying faunal material from archaeological sites is that we cannot determine the relative importance of the many factors affecting its survival; human and animal transportation, chemical and physical forces while buried, site erosion and the vagaries of excavation and post-excavation work. It must be accepted that the amount of bone fragments originally deposited on any archaeological site need not accurately reflect the original number of animals involved in the economy of the site, since stock could have been killed and butchered elsewhere and only a proportion of the bone brought to the site with the meat. Analysis of the representation of the individual body parts represented for each species may indicate whether or not this can be detected in the archaeological remains. Only a fraction of the bone originally deposited at a site will survive, and this will be biased according to the species and bone element concerned. Thus smaller and more porous fragments, bird, fish and small mammal bones, and the unfused bones of young animals of any species are more vulnerable. Unfortunately, research into the extent of these taphonomic constraints is not yet sufficiently advanced to allow adjustment to be made for such effects, but a consideration of the quality of preservation of the bone fragments at a site may indicate the likely standard of preservation. It is fortunate that the calcareous machair soils preserve bone to a very high degree and, generally, the material from the sites considered in this thesis shows little or no

signs of disintegration. A few pieces of bone from midden samples show extensive weathering, presumably due to their having been exposed on the midden surface for some time, before further deposits covered and protected them. Material from certain contexts (ie. Neolithic levels at the UX6 site at the Udal) shows dark staining and is considerably more friable than the rest of the material, but this is the exception rather than the rule, and has been noted in the analysis. In general, the material from the sites under consideration was in a good, but highly fragmented condition.

Some attempt has been made to determine butchery marks on the bones but, owing to the small samples generally recovered, the interpretation of such marks will be tentative. The analysis was mainly concerned with the bone from Sollas, since this showed more evidence for butchery cuts than any of the other sites, and discussion of the method and results of this study is fully covered in Chapter 7 (Figs. 14 and 15). Any evidence of abnormality in the bones was considered by Dr. S. Kempson and Dr. W. M. Stokoe (RDSVS, Edinburgh) and their diagnosis of the nature of the anomalies is recorded in Appendix 1. Unfortunately, many different diseases can produce the same morphological alterations in bone, while a single disease can precipitate different patterns of bone pathology; in contrast, most diseases leave no trace at all on bones, affecting only soft tissue, and cannot be recognized on archaeological material. Non-disease deformities, such as healed fractures, can usually be recognized (eg. Stothers and Metress, 1975; Siegal, 1976).

In addition to the evidence from the bones themselves, we must consider complementary sources of information from the sites. The structures themselves can give clues to the patterns of husbandry and production at a site, by the presence of associated enclosures, ancillary buildings and working areas. Information can also be gleaned from items of material culture such as quern stones, loom weights, fishing hooks and arrowheads. Caution must be exercised in the utilization of this information since much of it depends upon the correct assessment of function of any artefact. Even greater care must be taken in the application of ethnographic parallels: for many of the more remote areas in which the sites under consideration are located there are literary, pictorial and oral accounts dating back several hundred years and preserving a more "primitive" way of life, but we can only use these analogies to suggest one possible reconstruction of the situation several thousand years ago.

Many of the analytical techniques currently lauded are inadequate as a basis for an interpretative consideration of husbandry practices, particularly at small prehistoric settlements where sample sizes are small. As previously mentioned, the situation could be aided in some ways by greater attention to comparative studies on appropriate types of animals, kept under suitable nutritional conditions. However, using the above methods and techniques and under the direction of the stated aims of this paper, it is proposed to outline the geographical and archaeological situation of the sites under consideration, to discuss their various economic situations, and to consider any chronological or geographical variations evident over

the area as a whole. In this way it is hoped to arrive at a general consideration of the economy of the Outer Hebrides in Prehistory.

SECTION II. The sites.

Chapter 4.

The Udal, North Uist.

Excavations at the Udal, North Uist have been in progress for 20 years (Crawford, 1963-83) and the site (Fig. 16) presents a remarkable sequence of settlement from the Neolithic to the post-Medieval period. As previously mentioned in Chapter 1 rescue considerations have disrupted the planned research strategy of excavation and the situation at present is that the apparently extensive Bronze Age levels lie largely untouched while rescue of the Neolithic shore area proceeds. In the main research campaign excavation had already proceeded from Post-Medieval through to the later Iron Age levels. The discussion of the faunal material from the Udal must be considered as an interim report, since further material will become available, both from storage and from future excavation. The latter source promises considerable quantities of bone and will make a much fuller picture of the economy possible. For ease of handling in this discussion the material has been considered within the "Three Age" system to give a broad chronological framework. Since publication of the prehistoric sites at the Udal will not be possible for some time, the sites from which bone has been recovered will be summarily described here.

The earliest evidence for occupation so far recovered from the

Udal comes from the shore site (RUX6) where Neolithic material was associated with three almost intact building plans and elements of at least three others, including one mostly eroded by the sea. The ovoid buildings are successive in construction, with the earliest one re-used as a "working annexe" during the period of occupation of the next. Charcoal twigs from the hearth of this second building gave radiocarbon dates of 1770 ± 40 bc (2120-2340 BC) and of 1760 ± 50 bc (2120-2340 BC). (All dates from the Udal are calibrated after Suess, 1970.)

The Neolithic levels at UX6 are overlain by a slight Beaker layer of which there is more evidence at the nearby site of RUX3 where the Beaker levels are again picked up, producing in particular a large quantity of Beaker pottery, associated with a structure. Marine shell gave a radiocarbon date of 1516 ± 120 bc (1750-1920 BC) and animal bone gave one of 1614 ± 100 bc (1950- 2050 BC) for the Beaker level.

Above the Beaker levels at UX6 is evidence of a period of Early Bronze Age funerary and associated activity in the form of 3 cairns and a "ritual" enclosure fronting on to a standing stone. The skeleton from one Cairn cist gave a date of 1480 ± 85 bc (c. 18th Century BC). These cairns may be part of the cemetery which can be associated with a large midden and with 2 superimposed house structures with upstanding stone pillars revealed at the site of RUX1, c.30 metres to the north.

A series of small trenches have been dug to gather Environmental data around the Rubha an Udail headland, but while the levels in them can usually be designated as "Bronze Age" or "Beaker" due to their ceramic content, the level numbers are to be considered provisional until further excavation allows them to be traced from the main sites to these trenches. Bone was only recovered from Environmental Trenches VI, VII, VIII and X, and this was of such small quantities that it has not been included in any of the layer counts.

Although an eroded intermittent sill at a higher level at UX6 is tentatively considered to be Iron Age in date because of its associated material, the Iron Age settlement lies inland from the earlier sites on the North and South Hills. The South Hill (US) contains a small robbed-out wheelhouse, apparently re-used during occupation of the larger later wheelhouse, since it was plastered with clay and debris. The floor of this smaller building has still to be removed. The larger wheelhouse is divided by 11 stone piers, and has a "guard-chamber" at the paved, funnel-shaped entrance; an ovoid satellite chamber containing "stalls" and an upright stone; a boat-shaped hearth in the central area of the wheelhouse; and lenticular stone kerbs at the central edge of some of the cells. Some of the piers were blocked at a later stage, and post-holes against the inside of the outer wall suggest either a timber lining or perhaps roof supports since they were stone-packed and angled to the wall. Many pits underlay the floor of this larger wheelhouse containing occasional animal burials, among other material. Both wheelhouses are cut into extensive Bronze Age levels which are thus largely

protected. They include a funnel-shaped "smithy", dated by wood charcoal to 456 ± 160 bc (c.600-770 BC), and reminiscent of that found beside the wheelhouse at A'Cheardach Bheag, Drimore (Chapter 9). Dates for the wheelhouse levels at US have not yet been obtained, but on the North Hill (UN) a cemetery and cultivation levels are linked by the material assemblage to the wheelhouse levels at US, and have given a date from human bone of 90 ± 40 ad (c. 1st Century AD).

Immediately post-dating the wheelhouse levels at US is apparent "squatter" occupation, where several phases of rebuilding include the use of orthostats to block off the centre of the wheelhouse, and the construction of a souterrain. One of these "squatter" levels gave dates of 45 ± 40 ad and 50 ± 40 ad. The nature of the "squatter" occupation appears to differ considerably from that of the wheelhouse period, with much debris incorporated in the floor accumulations (including stratigraphically sealed mouse bones in large quantity) in contrast to the relatively sterile wheelhouse floors, though the artefactual contrast is slight. Unfortunately, due to the rather nebulous nature of the wheelhouse floors, it was almost impossible to make rigid divisions of context during excavation and, for the present at least, the wheelhouse and "squatter" faunal material will have to be considered as a single unit. The "squatter" levels form the upper end of the chronological span of this report, although levels on the North Hill continue through to the 17th Century AD.

Throughout the levels sheep and cattle are the predominant species, with a lesser quantity of pig in the post-Neolithic strata,

and with antler and a few teeth or bone fragments of Red Deer in all layers (Tables 1 and 2): there is no evidence for goat among the remains. Among the main food animals, a consistently high percentage of between 44% and 73% of sheep bone in all layers indicates a continual dependence on sheep (Table 3). Measurements suggest a small slender breed and indicate no significant alteration in skeletal proportions throughout the prehistoric period (Figs. 9 and 10). A lesser, but still considerable, quantity of cattle bone from the Neolithic, Beaker and Early Bronze Age periods (27%-54%) declines to between 14% and 26% in the later periods where pig is of increased importance (Table 3). Measurements of cattle bones suggest a small stocky breed, perhaps similar to the traditional 'Kyloes' or Black Cattle of the Highlands, and the species shows no alteration in stature throughout the later occupation of the site (Figs. 11 and 12). No measurements are available for the earlier periods. The ratio of sheep to cattle at each phase has been calculated, based both on fragment counts and on MNI estimations, and the results are summarized in Table 4. As can be seen, the ratio varies slightly according to the calculation method employed, and it is accepted that the figure based on the MNI estimation is more likely to mirror the actual situation at the site since this method does not include neonatal bones in the count and takes into account the differential degree of fragmentation of sheep and cattle bone. It is interesting to note that the ratio of sheep to cattle bone in a sample of the Post-Iron Age to Post-Medieval layers at the Udal averages 4:1 (Serjeantson, n.d.), compared to the average ratio of 2.9:1 obtained from the MNI estimates in the present study. This suggests that cattle

were of slightly greater importance economically in the prehistoric period than in historic times, but the sample sizes from all periods are too small for this to be more than a suggestion.

Pig first appears in the deposits in the Early Bronze Age and makes a fairly constant contribution of 11%-22% of the main food animal bones from the Pre-Wheelhouse period onwards (Table 3). The bones recovered are fairly small and are taken to be domesticated forms: no evidence for wild boar has been recovered from the site. Red Deer is represented only by a few bones and teeth (Table 3) but its presence in every layer indicates that it was an available source of raw materials and/or food throughout the periods under study. The bones recovered indicate animals of a similar stature to modern moorland examples (Fig. 13).

The majority of identified bone of the main species recovered from all levels at the Udal showed signs of butchery to some extent and a study was made of the degree of fragmentation of bone for the main food species. Conclusive results are not possible owing to the small size of the samples from the deposits, but the data supports the hypothesis that the larger (cattle) bones are liable to be broken into more pieces than the smaller sheep and pig bones. In the study the main meat bones (humerus, radius, femur, tibia) were compared to the bones most suitable as potential raw material (metapodials) and the number of complete bones were expressed as a percentage of the total identified bones within each of the two groups (Tables 5-8). Overall it is suggested that the degree of fragmentation was fairly

similar for meat bones and for metapodials in sheep (c. 35%) although for pig, which is roughly comparable in size, almost three times as many metapodials as meat bones were recovered intact. This is seen as predictable since a pig has 8 metapodials to a sheep's 4, and since the structure of a suid metapodial does not lend itself to implement manufacture as readily as that of a sheep. Very few intact cattle bones were recovered, reflecting their size, and it is presumed that this would also be the case for Red Deer if sufficient bones of that species were available for analysis. The individual cut marks noted on the Udal bones were compared with the pattern of butchery which was established for the Sollas material (Chapter 7 and Figs. 14 and 15) and the two were found to tally closely. Neolithic sheep bones from the Udal were more often broken in mid-shaft but whether for marrow extraction or meat removal is impossible to tell. In general both sheep and cattle bone from the Udal falls into the same pattern of butchery as that from Sollas although the number of bones exhibiting cut marks is much less.

A study was made of those bones which showed evidence of having been gnawed and no pattern of deliberate selection was evident: all bones seemed as likely to have been chewed as any other. The chewing took the form of 'puncture' marks and of 'furrowing', both of the form created by dogs and described by Binford (1981, pp.44-49). He further analyses the generalized strategy of dogs in dealing with bone and notes that they will deal with the softer, cancellous ends of a long bone before attempting to get at the marrow by licking it out or by crushing the shaft. Long bone shafts with both ends chewed

are evident among the chewed bone from the Udal and are considered to have been formed in this way. The importance of studying modification of bone by canine animals is that reduction of bones by chewing will greatly alter the number and character of the fragments recovered in the faunal assemblage. Thus the results of the fragmentation study above (Tables 5-8) are in reality dependent not only upon man's choice of butchery, cooking and tool-making preferences and the taphonomic forces acting upon the bone since its inclusion in the deposits, but also upon the degree and nature of chewing of the discarded bone by dogs. Unfortunately it is not possible to allow for this bias, any more than it is for most of the other constraints on archaeological interpretation.

Three different sizes of dog appear to be represented at the Udal, although it is difficult to assess this from a few fragments and teeth. Certainly there is evidence of an animal around the same size as a modern whippet, and one like a modern collie. There are also suggestions of a still smaller breed, which may perhaps be similar to the small terriers inferred from the material at the South Uist Wheelhouse sites. Of interest are the lower jaws of a neo-natal puppy, although it is not possible to assess the size of the adult animal from these. None of the dog bones showed any signs of cutting, burning or chewing and the animals are presumed to have been kept as working animals and/or pets.

Both Grey Seal and a lesser quantity of Common Seal are represented among the sea mammal assemblage at the Udal, from the

Beaker period onwards. The slight but consistent representation of these species in both adult and juvenile phases indicates their availability and use. As with much of the whale bone recovered from prehistoric sites, the fragments from the Udal have been heavily modified for, or through, use and very little is identifiable to species. The only exception in the Udal material is one piece which may be from a Pilot Whale, and one from a porpoise or dolphin.

The total number of bird species identified from the Udal is high (32) and covers a wide range of sea-birds, waders, passerines and other species (Table 9). Quality of preservation and excavation have been fairly consistent throughout so there is a surprising contrast between the paucity of bird remains from Neolithic, Beaker and Pre-Wheelhouse levels and the relative abundance from Early Bronze Age, Early Wheelhouse and Late Wheelhouse/ Squatter contexts. Nevertheless, it appears that birds were an accustomed supplement to the diet throughout the prehistoric occupation at the Udal.

Fish is consistently represented in the Udal levels, with the exception of the Pre-Wheelhouse layers from which the total faunal assemblage is very small. The greatest concentration of fish bones are found in the Early bronze Age and Late Wheelhouse/Squatter levels, where the numbers of frags. are swelled by the recovery of several almost complete fish. The range of species covers Euselachii sp. (Sharks and Rays), Gadoid sp. (Cod family), Conger Eel, Ballan Wrasse, Mackerel and flatfishes (Table 10).

From the Neolithic levels at the site were recovered 21 teeth and 250 bone fragments of sheep representing a neo-natal lamb and 10 older animals; 22 teeth and 96 fragments of cattle from at least one neo-natal calf and 3 older animals; 2 teeth and 12 fragments of Red Deer; and a single bone from a medium-sized dog. One bone each from a Turnstone and an Oystercatcher were identified; fish was represented by 2 fragments of Ballan Wrasse, 1 each of Ling and Cod, 2 of some species of Euselachii sp., and 4 unidentifiable fragments.

A very small quantity of bone was recovered from the Beaker layers at the site, comprising 22 teeth and 19 fragments of sheep from at least 3 animals; 28 teeth and 23 fragments of cattle from 1 neo-natal and 1 older animal; 4 pig teeth and a Red Deer tooth and bone fragment. A single bone indicated the presence of a small breed of dog and the sole seal bone recovered could not be assigned to any particular species. The scanty bird and fish remains consisted of a single bone each of Great Auk and Puffin, and an unidentified fragment; 2 Euselachii sp. vertebrae and an unidentified fragment.

There is a marked increase in quantity of sheep and cattle remains in the Early Bronze Age layers at the site, with 48 teeth and 81 bone fragments from 6 sheep and 1 neo-natal lamb, and 85 teeth and 62 fragments from 2 neo-natal calves and 2 older animals. Other species represented are pig (1 bone) and Red Deer (a tooth). Two breeds of dog are recognized in a jaw from an animal perhaps the size of a modern Whippet, and a tooth from a smaller breed. The few seal remains from these layers consist of a bone, probably of Grey Seal,

and 2 teeth of undeterminable species. Much fish and bird bone was recovered, both in terms of number of fragments and of species represented (Tables 9 and 10): 65 bird bones included 9 different species, and 134 fish bones included 7, although it must be noted that 85 of these fish bones came from 3 Cod, and 18 fragments from a single Rockling. An intact fish skull recovered from these layers has so far not been identified in Britain but it is hoped that research further afield will eventually identify the species; an identical skull has been recovered from an insecure context at the Udal.

From the Pre-Wheelhouse/Late Bronze Age layers (almost untouched by excavation to date) were recovered 14 teeth and 121 fragments of sheep, representing 1 neo-natal lamb and 3 older beasts; 19 teeth and 26 fragments from 2 cattle; 4 teeth and 18 fragments of pig; and a single Red Deer bone. Three seal bones have been identified to Grey Seal, and 8 bird bones represent only Razorbill, Great Auk, a medium-sized gull and a Skylark. No fish bone has yet been recovered from this layer.

A marked increase in pig bone is notable from the Early Wheelhouse level with 17 teeth and 147 fragments from 1 neo-natal piglet and 5 older examples of the species, as opposed to 30 teeth and 338 fragments from at least 9 sheep and 1 neo-natal lamb, 62 teeth and 172 fragments from 5 cattle and 2 neo-natal calves, and 1 tooth and 6 fragments of Red Deer. A medium-sized dog (perhaps the size of a modern collie) is indicated by 4 bones, and 2 jaws show a neo-natal puppy of indeterminate size. Two seal teeth have probably come from a

Grey Seal but 2 seal foot bones could not be identified to species. Fifty-eight bird bones include 14 different species (Table 9) and 36 fish bones cover 8 species (Table 10). Seven fragments of whale bone give no indication of species.

A much greater quantity of animal bone was recovered from the Late Wheelhouse/Squatter levels than from any other layers at the Udal, and this is attributable mainly to the 'Squatter' occupation which was characterised by the depth of occupation debris. The assemblage has been identified as comprising 155 teeth and 1691 fragments of sheep, including 6 foetal/neo-natal lambs, 3 neo-natal lambs and 3 older animals; 139 teeth and 324 fragments from 1 foetal/neo-natal, 3 neo-natal and 6 older bovids; 18 teeth and 283 fragments of pig, from at least 1 foetal/neonatal, 1 neo-natal and 5 older individuals; and 6 teeth and 16 fragments of Red Deer. Five bones denote a small dog, and 19 teeth and bones indicate both Grey Seal and Common Seal in the assemblage. In large collections of bird and fish bone (99 and 244 fragments respectively) are included 26 different species of bird (Table 9) and 13 of fish (Table 10). Five fragments of whale bone include a piece similar to Pilot Whale and 1 of dolphin or porpoise size.

Age estimation of the main food animals at the Udal is most unsatisfactory, largely due to the very small samples available, and it must be remembered that there are twice as many sheep fragments identified from the Late Wheelhouse/Squatter layer as from all the other layers combined, and almost as many cattle fragments from the

Late Wheelhouse/Squatter phase as from all the rest. Due to the fragmentary condition of many of the maxillae and mandibulae it is generally possible only to indicate that a jaw represents an animal over or under a certain age and this causes considerable problems of grouping and analysis. The situation regarding tooth wear analysis is even worse since this method is based solely on lower teeth and jaws which reduces the sample size still further. Epiphyseal fusion seems to give more intelligible results but the samples are still woefully small and can only indicate the likely situation. Throughout the levels it seems that sheep were usually killed before they were 3 years old, with a few animals surviving to a greater age (Table 11). Few neo-natal animals are represented and, indeed, sheep under 12-18 months of age are not frequent until the Pre-Wheelhouse, Early Wheelhouse and Late Wheelhouse/Squatter levels. This picture of most animals being killed at between 6 and 30 months old is supported by the evidence of tooth eruption which also indicates that perhaps a fifth of the sheep were allowed to mature to over 40 months (Table 12). It is suggested that the evidence for sheep at the site represents a breeding flock with the gradual culling of surplus animals from lambs under 10 months of age right up to old ewes over 42 months.

Table 13 shows that for cattle at the Udal the age structure seems to peak rather earlier than for sheep, and most of the animals represented seem to have been killed at less than 18 months old in the earlier deposits and under 24-36 months in the Late Wheelhouse/Squatter deposits. A few animals survived up to

48 months or over, and there is a higher percentage of neo-natal animals than for sheep. Cattle tooth eruption data does not contradict this picture although the sample sizes are very small (Table 14). From this data it is difficult to determine any distinct husbandry pattern but it seems likely that what is represented at the Udal is a basic subsistence strategy involving the maintenance of a few mature breeding cows (and presumably a bull or two) and, in the earlier phases at least, the slaughter of surplus animals at around one year old: this can be postulated as the early winter culling of the calves whose births would be necessary to keep the cows lactating. In the Wheelhouse levels the kill-off peak seems to shift to between 2-3 years of age, perhaps indicating a trend towards the increased importance of beef production since these animals were of the age when optimum weight gain had been reached.

Evidence for pig ageing at the site is rather limited but epiphyseal fusion data suggests a predominance of animals under 24 months old, with very few surviving to a greater age (Table 15). The results from tooth eruption study point to a more evenly balanced distribution up to around 36 months old with only a few animals over that age which are assumed to be breeding sows (Table 16). The role of pig in the economy is taken to be that of food supplement and provider of all manner of raw materials. It is suggested that perhaps only a breeding pair were maintained and their offspring slaughtered under 2 years of age. Given the propensity of the species to forage off household scraps, pigs would not be too difficult to overwinter and would provide a good economic return in terms of meat, blood,

skin, sinews, glue etc. and in the later periods a small herd was kept.

Over the prehistoric period at the Udal we are presented with a husbandry pattern which seems to change little with time, although it must be remembered that the samples available from the earlier deposits are very small and may not be representative of the original situation during occupation. Sheep appear to be the main food resource, kept as a breeding population, with young animals constantly available for meat and older animals for wool as well as reproduction. The lack of representation of neo- natal lambs may be due to differential survival of their fragile bones, or may perhaps be due to the use of summer grazing on the uplands, away from the settlements, as suggested by Serjeantson (n.d.); this would result in little or no neo-natal bone being found at the site itself. The same situation may prevail regarding neo-natal calves also. No husbandry bias is suggested for cattle in the earlier phases at the Udal. In the Wheelhouse phases there is a suggestion that culling took place when optimum weight gain had been reached at around 2 years old, and this may reflect an increased interest in beef production, although an increase in neo- natal animals rather points to dairying. The situation is unfortunately ambiguous and is probably further confused by the amalgamation of deposits from 'Wheelhouse' and 'Squatter' occupations which may well have been associated with different husbandry patterns.

Throughout the prehistoric occupation at the Udal, hunting deer and seal, fishing and fowling have always had a role to play in the

economy of the site, although this has varied in importance between the individual deposits. Food obtained from these sources in this quantity can have provided no more than variety in the diet, and is not represented in large enough quantities to be considered as a staple. Presumably the dogs identified from the site had a role both in controlling the stock animals and in the procurement of game.

It is regrettable that larger samples are not available, particularly from the earlier phases at the site, since this would allow more detailed analysis of the fauna to be made. As it is, the situation suggested by the available evidence is one of subsistence, based on domesticated stock: sheep, cattle, and in the later phases pig. Dog was kept, presumably as a herding/hunting aid and/or just as a pet. The hunting of Red Deer and seal, fishing and fowling supplemented the diet and the store of raw materials: the quantity of whale bone recovered could have derived from beached individuals with no necessity for deliberate pursuit. Overall, the picture presented by the faunal remains is of a broad-based economy, presumably including cultivation of areas of the machair, with emphasis on the keeping of domestic animals and the utilization of wild resources: the scale of these operations suggests individual family groups involved in subsistence farming.

Chapter 5.

Northton, Harris.

The complex stratified settlement site of Northton, excavated in 1965-6 by D.D.A.Simpson, lies on Toe Head, a mountainous promontory projecting into the Atlantic on the extreme south-west tip of Harris (Fig. 17). Six occupation levels were revealed there; all but the earliest separated from its successor by a deposit of sterile, wind-blown sand. The occupation levels consisted of two later Neolithic, two Beaker and two Iron Age/Historic middens, the final one being associated with a series of grass-covered enclosures on top of the dune (Simpson 1976). No bone was recovered from the earlier Neolithic layer so this deposit has been discounted in the following discussion. The material from the layers will be dealt with in chronological order.

The main mammals represented at Northton are sheep, cattle, deer and a small quantity of pig, horse, dog and seal (Tables 17, 18 and 19). The small number of ovi-caprid horn-cores found are all from sheep and there is no evidence that goat was also present at the site. Due to the fragmented nature of the remains, few measurements could be taken for sheep and cattle from the Northton material but the small amount of information gleaned suggests the same small

domesticated types as recovered from other sites in the Outer Hebrides in prehistory. Red Deer forms the main wild animal resource at the site, in the form of bones and antler. Both cast and cut antlers were recovered, much of it showing signs of working. Only four pig bone fragments and two tusks were recovered at Northton and this quantity is too small to allow an assessment of their importance in the economy. However, the tusk from the Neolithic layer shows the 'beading' characteristic of wild boar, while that from an Iron Age II context does not exhibit this feature and may be from a domesticated animal: such a distinction can only be a suggestion due to the small size of sample available. One tooth from the Beaker V/VI layer and one foot bone and three teeth from the Iron Age show merely that horse was represented in these periods at the site, but we can glean nothing about the proportions and possible breed type from these fragments. Three teeth are the only remains of dog from the site but the presence of domesticated canines is known elsewhere in the Outer Hebrides, and tends to represent either a large retriever-type animal or a smaller terrier type, or both at the same site (eg. A'Cheardach Mhor, South Uist).

The 25 bones and 9 teeth of seal from Northton come from both Phoca vitulina Common Seal) and Halichoerus grypus (Grey Seal), with adult and juvenile animals represented. The availability of seals, the relative ease with which they can be captured and their value as food and raw materials is reflected in their representation in every layer at the site. The only other wild mammals found are Meles meles (Badger) and Lutra lutra (Otter). Both may possibly be

intrusive into the deposits but it must also be borne in mind that both species are edible and have been trapped and eaten within living memory. The pelts of both species would also have been valuable commodities for personal use or for trade. Very little whale bone has been recovered from the site and much of what there is was so badly fragmented that identification was, at best, hazardous. Nevertheless, it is possible to say that the closest identification suggests Globicephala melaena (Pilot Whale), Orca gladiatoris (Killer Whale) and some type of Balaenopterid to be represented. Fish is found in all layers, to varying degrees (Table 20). The species identified are Gadus morhua (Cod), Molva molva (Ling), Conger conger (Conger Eel) and Labrus bergylta (Ballan Wrasse). Birds are also found in all layers, albeit sparingly in the Iron Age levels, and the range of species is large (Table 22). Considerably more bird bone than fish was recovered (77 fragments as opposed to less than 40 fragments respectively) but this may be a recovery bias since the smaller bones of both fish and bird were not recovered, although they might be expected to have survived.

A consideration of the identified fragments from the Neolithic layer at Northton shows 219 sheep fragments (from at least 7 neo-natal and 9 older animals), 54 cattle fragments (from at least 1 neo-natal and 4 older beasts), 17 deer fragments from a single animal, a single pig tusk which might be from a wild boar, and 3 teeth and 4 bone fragments of seal (Tables 17 and 18). The predominance of sheep remains, if accurately reflecting the economic situation of the period, suggests a herding economy with a few cows, presumably for

milk and dairy products. The deer, seal and possibly boar remains represent the hunting aspect of the economy, supplemented by fishing (a Conger Eel jaw) and fowling. The birds identified (Shag, Gannet, Guillemot, Puffin and probably also Redshank, Blackbird and Herring Gull) are all resident in or around the Outer Hebrides for most of the year and no seasonal bias can be found in the species selected. A piece of worked whale bone testifies to the use of this resource but cannot be identified as to species.

The fragment count for the Beaker VII layer shows a substantial difference from that for the Neolithic stratum although the total number of identified fragments is the same (Tables 17 and 18). The quantity of sheep fragments is reduced to 91 (from 1 neo-natal and 5 older sheep), and of cattle to 83 (from 1 neo-natal and 3 older animals including a fragment from a massive maxilla), while that of deer is increased to 123 (from 7 individuals). If an accurate reflection, this shows a dramatic change from the emphasis on domesticated animals of the previous period to a heavy accent on the hunting of Red Deer. Only 2 pig bones were recovered from this layer and it is not possible to say whether these represent a hunting or a rearing resource. More fish was recovered from this layer, although this may not be a true reflection of an increase in use, and consists of Ballan Wrasse, Conger Eel, Ling and Cod. These are all large examples of their species and were presumably caught from boats as they are not generally inshore types. Much bird was also recovered, comprising Cormorant, Shag, Puffin, Guillemot, Fieldfare, Redshank and probably Kittiwake, Raven, Goosander and Red-throated Diver. All of

these are resident in the islands with the exception of the Fieldfare which is a common winter visitor and passage migrant and Goosander which is a rare visitor to the area; again, no evidence of seasonal exploitation of bird resources can be detected. The layer also contained 3 seal bone fragments, a mandible and 3 seal teeth, as well as jaw and skull fragments of Badger and Otter. As already mentioned, the latter two may be intrusive but both are perfectly edible and would provide a note of variety to the diet, quite apart from the value of the pelts. Two pieces of worked whale bone were unidentifiable.

A much smaller sample for the Beaker V/VI layer shows only a few fragments for sheep (1 neonatal and 2 older), cattle (from 1 animal) and deer (from 1 animal), one pig fragment (which probably derived from a domesticated animal), 2 seal fragments and the first recovery from the site of remains of Canis familiaris, the domestic dog (Tables 17 and 18). A single unerupted horse tooth indicates the presence of a horse or pony and it is unfortunate that no bones of this species were recovered from this layer to indicate size, age etc.. The bird species identified are Cormorant, Shag, Guillemot, Gannet, the now extinct Great Auk, and probably Puffin, Little Auk and Stork. Most of these are resident in the area, with the exception of the Auks and Stork. The flightless Great Auk was described by Martin in 1698 as coming to St. Kilda on the First of May and leaving again in mid-June. This suggests it may have been a summer visitor to the area but we know too little about the bird to be sure. The Little Auk, in contrast, is an irregular visitor to the Hebrides, while the Stork is

such a rare visitor that no seasonal pattern to its appearance can be deduced. A few fish fragments and a single piece of worked whale bone were also recovered, but these were not identifiable as to species.

The Iron Age II sample is taken from midden deposits and, as such, is only a very small proportion of the total midden accumulation. The fragments count shows only 19 identified sheep fragments (from 1 neo-natal and 3 older animals), 26 of cattle (1 neo-natal and 2 older), and 214 from 8 deer (Tables 17 and 18). This disproportionate amount of Red Deer bone could be taken as a sampling bias, particularly since the layer also produced much antler, in the form of 8 cast antler pedicles, 5 cut off from the skulls and some other fragments. Whether the sample chanced on an area where it was customary to dump deer bone and antler waste, or whether the whole midden shows this bias we cannot say. Nor, since both cast and cut antlers are found can we make any judgement of seasonal exploitation, or decide whether antler or venison was the main resource sought from the animal. A single pig tusk from this layer appears to be of a domesticated form but it is possible that it derived from a wild female animal. In addition to the above, 12 bones, 3 teeth and a mandible fragment of seal were recovered, a single bone of Gannet, and a few fragments of Conger Eel and Cod. For the first time at the site some whale bone of a size to be identified is found; Pilot Whale and Killer Whale suggest the closest parallels. This would be a most important resource for a small island community which could make use of every part of a whale carcase for building, oil, fuel, etc.

The Iron Age I material is again a small midden sample, with fewer fragments recovered than in the previous level (Tables 17 and 18). A fragments count shows 26 sheep fragments from at least 2 individuals, 32 of cattle (1 neo-natal and 3 older) and 9 fragments from 2 deer, as well as 3 teeth and 1 bone of horse, 1 pig fragment, 2 seal fragments and 2 dog teeth. The quantities are too small to allow for much comment, except to note their presence, particularly that of a small breed of horse, which is presumably similar to the pony type recovered from the South Uist Wheelhouses. The sheep remains include an articulated forelimb and hind 'ankle' joint, and the cattle remains include an articulated lower forelimb. Bird is represented only by 2 unidentified bones and a Stork bone, fish by a Ling jaw and a few Gadoid vertebrae, and whale by a fragment from a Balaenopterid .

Due to the small sample presented from Northton, only tentative deductions can be made as to the relative representations of the various species at the site. The evidence we have suggests a distinct shift in economic emphasis from the situation in the Neolithic, dominated by sheep, to the Beaker VII period with a massively increased percentage of deer bone and antler, associated with a reduction in sheep population, an increase in cattle and the introduction of pig, whether as a domesticated or a game animal. The material from Beaker V/VI is really too sparse for assessment, except to note the appearance of horse remains. Iron Age II presents an even greater percentage of deer bone and antler than Beaker VII, accompanied by an almost negligible amount of sheep and cattle. The small quantity of material from Iron Age I includes all the main

species in small amounts. In the utilization of wild resources other than deer, Beaker VII has more small mammals and fish, and as much bird as the Neolithic deposit. Very little bird and fish are recorded from the later layers at the site. Seal is found in small quantities in all layers.

The few measurements of sheep and cattle bones which could be made suggest that the animals represented at Northton are generally of the same type as those from the Udal and other sites (Figs. 5-8, 11 and 12). The exceptions to this are the 2 examples of cattle 1st phalanges from the Neolithic deposits at Northton which are considerably longer than any others measured (Fig. 11): unfortunately no interpretation can be made of this anomaly due to a lack of further examples from this layer.

The ratio of sheep to cattle at each phase has been calculated, based both on fragment counts and on MNI estimations, and the results are summarized in Table 21. As can be seen, the ratio varies slightly with method and phase but overall the ratio is 1.6:1 which is much lower than that obtained from the material from the Udal (Chpt. 4). This suggests that cattle were of more importance in the economy at Northton, but the samples are too small for definite conclusions to be drawn. Ageing data for sheep (Tables 23 and 25) suggests that a double-peaked kill-off scale may be evident: young animals around a year old are more frequent, as are older animals of around 3 years old. This pattern is mainly seen in the Neolithic phase, since there is not enough information for the other periods and it is suggested to

be representative of a subsistence economy where surplus animals are culled at around a year old before the winter, while the older animals are maintained to replenish the flock and to provide wool and milk. No possible pattern of husbandry for cattle can be discerned in any phase at the site, due to a lack of ageing data (Tables 24 and 26).

The general health of the animals represented at Northton seems to have been good, at least as far as can be determined from the bones. In the Neolithic assemblage 3 sheep ribs appear to show healed fractures and on a sheep maxilla fragment the P4 tooth is twisted in its socket: this is quite common and would not be detrimental to the health of the animal. A deer astragalus from the Iron Age II layer shows considerable destruction of the bone cortex and 'grooving' on the distal articular surface, characteristic of arthritic processes. Some of the bone material shows evidence of having been chewed but there is not enough to present a pattern of selection (random or deliberate) of particular species or anatomical elements. All chewed bones show puncture marks and furrowing, probably the result of gnawing by dogs. Very little evidence for deliberate cut marks was found on the bones and consequently no pattern of butchery practice can be suggested.

Considering the importance of this site, it is unfortunate that a larger sample is not available for analysis. There is a tantalizing suggestion that a sudden change in economy can be seen between the Neolithic and the (earlier) Beaker VII layers but present bone evidence permits only tentative suggestions to be made.

Chapter 6.

Rosinish, Benbecula.

The settlement site at Rosinish lies on a peninsula on the extreme north-east coast of Benbecula. The small area of grassy, machair hillocks, remnants of undepleted high machair, contrasts with the predominant brown moorland surrounding it (Fig. 18). The site, fast eroding due to marine and aeolian forces, was surveyed and excavated by I.A.G. and A.N. Shepherd between 1974 and 1977 (Shepherd, 1975; 1976; 1977: Shepherd and Tuckwell, 1974; 1977: Tuckwell and Shepherd, 1976).

Two areas of Beaker midden were excavated: one containing the remains of a house, the other an extensive face of thick midden deposits near the shore. The former (Area II) consisted of a partially eroded midden area overlying a layer of burnt clayey-sand which showed traces of five possible stake-holes, several small fire pits and a large pit containing large quantities of food refuse. These signs are taken to represent a temporary shelter of some kind. The larger area of midden deposit (Area I) was underlain by considerable evidence of cultivation in the form of ard-marks and of carbonised cereal remains. Numerous centres of activity were recognized in Area I, including patches of fire-marked sand, small

pits, a stone-walled shelter, a burial area and a large multi-period shell dump, possibly reflecting (seasonal) changes in line-baiting (Shepherd 1981). Iron Age and Medieval occupation at the site is represented by 2 upper midden levels which appear to have been extensive, although no structures are now visible in any of the dune sections. The Iron Age level contained Wheelhouse pottery of the Second and Third Centuries A.D. but the surface of the layer had been eroded in antiquity.

Faunal remains from the site were few in number and in a poor state of preservation. Unfortunately the assemblage could only be studied in a very limited time period and without the benefit of a reference collection, so the accuracy of the identification cannot be guaranteed. Since this is not the definitive identification of the material, the assemblage is not listed in this thesis. Owing to the paucity and fragmentation of the bone, as well as the uncertain identification, no statistical analysis or mensuration has been applied to the material and the species represented will only be mentioned in passing.

From Area I were recovered mainly sheep and cattle teeth (which are generally more resistant to decay than bone), with a few fragments of sheep and cattle bone, deer bone and antler fragments, bones of a small mammal (possibly an otter), a couple of bird bones and a fish bone. From Area II the majority of the assemblage again consists of sheep and cattle teeth, with a few fragments of bone from these species, some deer bones and antler (including both cast and cut

antler), two pig bones, and again the bones of a small mammal (as in Area I).

Regrettably, further discussion of this material is not possible at this stage, except to note that the species represented (but not necessarily the relative quantities of the species) are wholly consistent with the situation in the Beaker layers at Northton in Harris, although no comment as to the relative proportions of the species can be made.

Chapter 7.

Sollas, North Uist.

The wheelhouse site at Cnoc Sligeach, Sollas, North Uist (Fig. 19) was excavated in 1956 by R.J.C. Atkinson, on behalf of the Ministry of Works, in advance of the proposed construction of a guided missiles range on the west coast of the Uists. The site was backfilled following the excavation and is now undetectable on the ground, even with a detailed map. Upon investigation the site proved to consist of two wheelhouses and an associated midden, interpreted by the excavator as follows: the larger structure (Wheelhouse B) is inserted into a pre-existing midden of some 400 feet in diameter. A short distance south of Wheelhouse B and clear of the midden is a smaller, ruined structure, Wheelhouse A, which shows evidence of more than one period of construction. The inference is that Wheelhouse A preceded Wheelhouse B, that it may have been the main contributor to the midden which also predates Wheelhouse B and that, when abandoned, it was probably robbed of its stones for the building of Wheelhouse B which was virtually intact when excavated.

The total faunal assemblage from the site can be divided into "domestic" material, contained in floor deposits in the Wheelhouses and in midden samples, and "ritual" material from a series of 129

internal pits under the floor of the larger, more intact Wheelhouse (WH/B). These pits are of varying sizes and contain parts of carcasses, whole ones and bits which had manifestly been butchered, as well as, in one instance, the cremated bones of a sheep, deposited in a wheelhouse-type cinerary urn; these deposits are taken to be of a ritual character.

In dealing with the faunal material itself, it has been decided that the bones from the smaller Wheelhouse (WH/A) should be treated as a unit, as the excavator feels that, while there is no valid way to separate the phased finds chronologically in any significant sense, all the material from WH/A belongs to some phase of occupation of the structure, and there is no evidence to suggest that any of it was dumped from elsewhere after occupation had ceased. Due to the resources available during excavation, it was possible only to sample the midden deposits: since the samples came from widely separated areas within the midden, it is not possible to relate the sequence in one area with that in another; hence the midden material (WB) will also be treated as a unit and considered as a random sample, due to the unknown variables affecting any archaeological sample. A distinction is made between floor deposits and pit contents in dealing with material from WH/B, and the contents of each pit are considered separately. There is a small amount of faunal material which can be assigned to "refill" within Wheelhouse B and this is treated as a separate unit. The WH/A, WH/B and WB material assemblages have been considered separately for the purposes of identification and quantifying, but have been grouped for measurements, determination of

breed and evidence for butchery practice, as it was felt that such amalgamation of the deposits was acceptable, given the obvious connections within the complex, and the lack of clear chronological separation: preliminary investigation showed no significant variation between the deposits in these respects.

It should be noted that the sample of bones recovered from the site is representative in the gross sense, in that it includes all the bones or bone fragments visible to the excavators, and that, except in a very few cases, no sieving was carried out. In the following discussion of the material, the floor and "ritual" pit material from WH/B will be discussed separately from the "domestic" remains of WH/A and WB, before the site is considered as a whole.

The faunal material from the smaller WH/A is lacking in individual contexts and must be considered as a unit. It comprises much ovi-caprid and cattle bone (85 teeth and 374 bone frags. representing at least 2 neo-natal and 14 older sheep, and 109 teeth and 158 frags. from at least 2 neo-natal and 4 older cattle respectively), with a lesser amount of pig (23 teeth and 20 frags., probably from a single animal), and deer (1 tooth and 5 frags.). This data is summarized in Tables 27, 28 and 29. Since the only ovi-caprid horn-cores found were of sheep, it is assumed that no goat was present at the site. Sheep bones were found in sufficient quantity and in a suitable state of preservation, to enable measurements to be made: these point to a small, slender-limbed breed, similar to that which appears to be represented at other sites in the

Islands, which compare closely with the bones of the "primitive" Mouflon type surviving today in the Shetland breed. The results of both epiphyseal fusion study (Table 30) and tooth eruption analysis (Table 31) from WH/A suggest that some of the sheep population represented were surviving to over 3 years old: this is taken to indicate breeding stock, dairy products and a wool supply. A further concentration of sheep bones and jaws from animals between 6 and 30 months old suggests a flourishing flock with animals surplus to breeding/textile requirements being culled at around 2 years of age, at the point of optimum return (in meat) for input (feeding).

The general small size of the cattle bones from WH/A suggests that they were small, delicately boned animals of much the same build as the West Highland or "Black" Cattle, the traditional breed in the Western Highlands and Islands (Robertson, 1875). Unfortunately the sample of cattle bone is too small for any definite pattern of husbandry to be perceived. At least one animal certainly survived to over 42-48 months but the number of fragments recorded and the MNI estimations made are so small that any attempt at further analysis would only be misleading. It can only be suggested that a cow was kept for milk and other dairy products and occasionally brought to calf, either to raise as meat or for trade, or to replace the cow when she was past her prime. A massively robust scapula may represent a bull kept for breeding.

Horse is represented only by two bones, and no indication of size can be gained. The pig canine tooth recovered from the site did not

show the "beading" characteristic of wild boar, and the few pig remains recovered are assumed to be domestic. Pig remains are even more sparse than those of cattle and it can only be assumed that one or two pigs were maintained and occasionally bred as a source of meat and raw materials. Tooth eruption data (Table 32) seems to support this view. Since the Uists present little natural forage for pigs, they would have to be provided with all their food and this may account for their apparent unpopularity as stock animals at Sollas. Useful in this context is a reminder of the tradition, still current in parts of Ireland today, of keeping a couple of pigs (often in the kitchen) whose offspring were eaten or sold, and who were themselves eaten when their breeding life was over.

Dog is represented only by 3 teeth, one of them a canine from a fairly large dog, and 2 metatarsal fragments from a medium-sized dog.

Red Deer is apparently the only wild animal present and is evidenced by a few bones and a considerable quantity of worked and unworked antler: there is no evidence either way for antler being cast or cut from the dead animal. The large size of some of the pieces of worked antler, obviously cut from the main beam, gave the excavator "the impression of being significantly larger than the antlers of modern Red deer, which live in a moorland environment" and, as he points out, "the larger size of prehistoric Red Deer is usually attributed to the presence then, but not now, of a forest environment" (R.J.C. Atkinson, pers.comm.). Since pollen analyses (discussed in Chapter 2) have pointed to the absence of forest cover in the Uists by

this period, and since the low fertility of the soil and vegetation will further inhibit body and antler growth, it seems unlikely that such large antlers would be produced by the Uist deer. Certainly the deer bones from Sollas are fairly small in size and comparable to modern moorland deer (Fig. 13), with the exception of a comparatively larger sacral fragment. It is conceivable that antler, as a valuable commodity, was traded and it may have been that the large diameter examples were traded over from the mainland. Cetacean bone occurs as both worked and unworked fragments, and fish (Table 34), bird (Table 33), seal and crustacea are occasionally present. Throughout the site rodent and lagomorph bones are considered to be intrusive and will not be discussed, while the few pieces of human skull from WH/A are insufficient for comment.

From the midden were recovered "little meals", that is, small heaps of shells, interpreted by the excavator as the remains of individual repasts: unfortunately, information regarding the species contained within these deposits is not available at present but it seems reasonable to suggest that the species most commonly found today, and at other archaeological sites in the area would also be favoured then. The species represented by the bones recovered from the pre-WH/B samples are sheep (31 teeth and 98 bone frags. from 1 neo-natal and 7 older animals), cattle (62 teeth and 139 frags. from 1 neo-natal and 2 older animals), pig (4 teeth and 14 frags. from a single pig), deer (4 frags. and several pieces of antler), and a single horse bone which appears rather fresh and may be modern (Tables 27, 28 and 29). The same patterns as those seen for the WH/A material

can be seen on a smaller scale in the sheep and cattle remains from the pre-WH/B midden sample and are interpreted as further evidence of the same husbandry strategy. A few bones of bird and fish were also recovered (Tables 33 and 34) and some fragments of whale bone. From the post-WH/B 'refill' came only fragments of a single sheep (1 tooth and 12 frags.), 1 neo-natal and 2 older cattle (9 teeth and 20 frags.), pig (1 tooth and 1 frag.), deer (1 frag. and some antler), and horse (1 tooth and 1 bone). There is too little material from this context to allow further comment (Tables 27, 28 and 29).

The 13 cells around the central area in Wheelhouse B produced varying amounts of faunal material in complex arrangements of floors and pits, with the exception of Cell 3 from which there appears to be no bone. Material from each cell will be considered separately.

Excavation of Cell 1 revealed two floor levels overlying four pits. None of the contexts produced more than scraps of the main food animals and a single bird bone, with the exception of Pit 1 which contained foot bones of at least two cattle. None of the remains from Cell 1 suggested other than normal domestic refuse.

Cell 2 comprised three superimposed floors overlying a single pit. None of these produced anything of note.

In Cell 4, five floor levels were interleaved with four inter-floor levels, and overlay three pits. The material from Pit 2 and Floor 1 are unfortunately missing. The floor and inter-floor contexts

contained only scraps of the main domestic animals and a few fragments of fish bone (Pollachius virens Saithe). The two pits from which material remains contained a large quantity of burnt cattle bone, possibly the remains of a single animal in each.

The five floor levels of Cell 5, overlying five pits, again contained scraps of the main food animals, fragments of fish bone (Gadus morhua Cod and possibly Pollachius virens Saithe) and bones of Black Grouse and Pied Wagtail. Three of the pits held only scraps but Pit 2 contained a quantity of sheep bone, some of it burnt, a complete bovine aged about 12-24 months and other scraps. Pit 4 held a single sheep aged less than 13- 16 months.

Under the four floors in Cell 6 were found an under-floor level and two pits but unfortunately the bone from one of the pits is no longer available. None of the contexts produced more than scraps of the main domestic animals and unidentifiable remnants.

In Cell 7 the two floors and two inter-floor levels covered a "pocket" of material and 8 pits: material is not available from the lower inter-floor layer and one of the pits. Floor 1 and the blown sand above Floor 2 contained only scraps but Floor 2 itself produced remains of a sheep between 6-16 months old and other scraps including a bird bone. Pit 1 held the articulated "ankle" joint of a sheep and some scraps, and Pit 2 contained a fair quantity of scraps of the main food animals and unidentifiable material, both burnt and unburnt. The burnt remains of a 42 month old bovine filled Pit 3, an

unnumbered pit held the unburnt bones of a calf of less than 12-18 months and a few other scraps, and Pit 7 contained another bovine under 12-18 months, a lamb of 6-16 months and a few scraps. The remaining contexts revealed only fragments of the main species, and of unidentifiable material.

The eight pits in Cell 8 lay under a single floor and an under-floor stratum. Material was sparse and unremarkable (sheep, cattle, pig and fish ie. Gadus morhua Cod) from all contexts with the exception of Pit 5 which held quite a lot of burnt cattle bone (although apparently not a single animal) among other fragments.

Cell 9 consisted of a floor and two under-floor layers (not as yet able to be amalgamated), over fifteen pits, of which bone is available from fourteen. Pit 1 contained a sheep of 24-30 months; Pit 2 a burnt piglet under one year old; Pit 3 a calf under 12-18 months old; Pit 5 a lamb of about 10-18 months old; Pit 9 a sheep of over 36-48 months and a lamb under 10 months old; Pit 10 an articulated forelimb of a sheep; Pit 12 a sheep over 36-42 months old and a lamb of around 12 months old, among other fragments; Pit 19 a lamb of about 10-18 months old. Pit 16 held the burnt remains of at least seven lambs ranging from under 10 months to 13-16 months. The other contexts contained only scraps of the main animals and unidentified fragments.

Under the Floor in Cell 10 was a sandy layer from which the bone is not available, and under that again were three pits. The Floor

produced neo-natal and adult sheep bones, neo-natal cattle fragments and some bones of Pollachius virens Saithe. Pit 2 contained a sheep between 18-30 months old, and one of the other pits (unnumbered) produced neo-natal lamb bones. The remaining pit held only unidentifiable fragments.

The Floor, under-floor layer and pit in Cell 12 held very little material, identifiable or otherwise, including some neo-natal cattle bones from below the Floor.

In Cell 13 the two floors and two pits produced only scraps, most of it unidentifiable. The material from the under-floor sand is not available.

The two floors in Cell 14 produced only scraps of the main animals and a whale bone fragment. Pits 1 and 3 held sheep, cattle and pig, and Pit 2 contained the remains of a sheep about 42 months old.

The central area of Wheelhouse B is made up of a single floor level over numerous pits. For ease of reference these will continue to be dealt with by quadrant, as they were excavated. The floor level contained much sheep and cattle bone, less of pig and a single deer bone, as well as much unidentified material. The sheep remains comprise bones from several animals, including a complete sheep over 36-48 months and two foetal lambs. Cattle remains include two neo-natal calves among fragments from older animals, some of them burnt.

Pig remains are sparse.

In the NE Quadrant bone remains are available from sixteen pits, four of which contained only scraps. Pit 1 contained two sheep of around 24-30 months old, and fragments of burnt cattle bone. The large amount of burnt bone in Pit 2 included a neo-natal calf, a calf less than 12-18 months old, a slightly older animal of between 12 and 30 months of age, a few sheep and pig fragments and much unidentifiable material. Pit 4 held a lot of bone including two sheep aged 13- 20 months, fragments of a neo-natal calf, burnt fragments of at least two adult cattle, a single pig bone and much burnt and unburnt material. In Pit 6 were two sheep, one between 18 and 30 months old, the other less than 18 months. Pit 8 held two neo-natal calves, and two sheep, aged about 18 months and over 42 months respectively. Pit 10 contained a lamb about 10 months old, two sheep aged over 36-48 months, another between 10-18 months, and fragments of two calves under 18 months. In Pit 11 a few sheep fragments were accompanied by two calves under 12-18 months old. A single sheep aged between 18 and 30 months old was recovered from Pit 13, a lamb of about 10 months from Pit 14, and one of between 10 and 24 months in Pit 15. Much burnt bone in Pit 22 included a few fragments of sheep and deer and at least three cattle over 18 months old, at least one of which was over 42-48 months old. In a small pit (unnumbered) were the remains of two lambs under 13-16 months old.

Excavation of the SE Quadrant was curtailed due to the danger of

wall collapse and, although pits were located under the floor level, they could not be excavated.

Bone material is available from twelve pits in the SW Quadrant of which four contained only fragments. Pit 1 included foot bones apparently from a single sheep, and in Pit 4 a large quantity of burnt bone produced only a few scraps which could be identified. Pits 3, 12 and 20 each contained single sheep, aged over 36-48 months, over 36-42 months and between 10 and 18 months respectively. In Pit 5 a very large quantity of burnt bone included a bovine over 42-48 months old, fragments of sheep, pig and deer and the unburnt bones of a piglet under a year old. Pit 14 included at least two cattle, one over 36-42 months, one under 24-30 months, while Pit 16 contained at least three sheep, two over 36-48 months, the other between 10 and 18 months.

The NW Quadrant produced bone from fourteen pits, of which five contained only scraps. Pit 1 included a foetal lamb among fragments of sheep and pig, burnt and unburnt. Pit 2 included a foetal lamb, a calf under 18 months and two burnt pigs of 12-24 months old. Pits 5 and 8 each contained a burnt piglet under 12 months old. In Pit 11 was a foetal lamb, in Pit 21 a foetal lamb and a sheep over 36-48 months old, and in Pit 22 a foetal lamb. In Pit 10 a burnt sheep was aged over 36-42 months and in Pits 14-16 were a foetal lamb, a burnt lamb aged under 13-16 months, a burnt sheep over 30 months, a neonatal calf, a calf under 18 months, a burnt bovid over 42-48 months and some burnt pig fragments.

The faunal material from the floors and inter-floor levels of WH/B, from WH/A and from the midden samples does not suggest other than purely "domestic" refuse which could be accidentally included in the floors of dwellings or dumped on the midden outside. The pits, which seem to precede the floor levels, not to be cut into them, present a rather different case. Since we are unable to determine exactly why the users of the building chose to bury complete or partial animal carcasses, as well as miscellaneous fragments of bone, in pits inside the building, we tend merely to classify such behaviour as "ritual" and treat it as totally distinct from any secular activities evidenced at the site. However, it is vital that we should not impose our own cultural dictates upon the remains from the site since a glance at many societies, past and present, shows that "ritual" and everyday living can be inextricably bound together to an extent which our own society finds difficult to comprehend. Thus, although the faunal material from Sollas has been tentatively divided into "domestic" and "ritual", depending on its context, we must accept that a fair amount of "domestic" scraps seem to have found their way into the pits, and we cannot tell whether the animals in the "ritual" pit burials were specifically killed for the purpose, or whether a natural loss was used for ritual purposes when available - a most economical method of propitiation! Certainly the majority of the sheep from the pits were aged over 36-48 months or under 18 months, with seven neo-natal lambs identified. In the same way the cattle from the pits were mainly under 18 months or over 42- 48 months, plus five neo-natal calves. Pig was surprisingly little represented but in all six

of the burials which included pig the animals were under 24 months old (under 12 months in four cases). Both burnt and unburnt carcasses were recovered, with most sheep being unburnt, cattle fairly evenly spread between both, and five of the six pigs cremated. Animals were found singly, with others of the same species, with other species or with apparently miscellaneous refuse. Burnt and unburnt bone was often mixed in the same pit and some pits contained only fragments of bone, often unidentifiable. No obvious trends were discerned among the pit contents and hence, unfortunately, no suggestions can be made as to the "rituals" implied by such material.

The evidence for the practice of butchery is obviously of prime importance in any consideration of the economy of the inhabitants, as reflecting social, religious or dietary preferences. For the purpose of analysing the various elements of butchery practice on the Sollas material, a distinction was drawn between "stripping marks" which are taken to represent the removal of skin from the legs, meat from the bones or the cutting of tendons, to aid disarticulation, and "chopping marks" which are seen as the cutting through of bones to separate elements or to divide the larger elements into smaller units. It must be noted that the small size of the sample limits us to a general idea of the butchery process at the site, although the correspondance of the results with the evidence from other ungulate studies suggests that this may represent the logical and efficient way of processing the carcass. On those points of detail for which we have no direct evidence from the site, we can extrapolate from the ethnographic parallels the probable situation at the site. The individual butchery

cuts on the Sollas material are considered below and in diagrammatic form in Figs. 14 and 15.

The evidence for the butchery of sheep at Sollas is as follows (cut mark numbers referred to below relate to the numbers on Fig. 14): skinning of the animals is apparently represented by 'stripping' marks at the metapodial, phalangeal joints (Cut 1), or on the dorsal, lateral and medial surfaces of the astragalus and calcaneum (Cut 2): this process is not shown by cut marks on the carpal bones but this is not notable since the cartilage and ligaments can be easily severed at this point without leaving any trace on the bones. The disarticulation of the fore-leg is achieved by separating the distal scapula from the proximal humerus, either by severing the heads of the muscles with a knife and then disarticulating the humerus head from the glenoid cavity of the scapula (Cut 3), or by chopping the joint apart with a heavy blade (Cut 4). The distal humerus/proximal radius/ulna were disarticulated at the 'elbow' (Cut 5). The hind-leg was diarticulated by the pelvis being chopped through near to the acetabulum, sometimes also catching the head of the femur (Cut 13). No cut marks were noted in the acetabulum, but a few knife marks on the head of the femur (Cut 6) may indicate disarticulation of the femur from the innominate bone, although it is difficult to sever the muscles without scoring the wall of the acetabulum. Knife marks on the pelvis, radius, femur and tibia shafts are probably associated with defleshing rather than dismembering the carcass. Ethnographic parallels (eg. Guilday, Parmalee and Tanner, 1962) suggest that the hind-quarter from hip to hock could be processed as a unit in small

ruminants, which supports the lack of evidence of disarticulation of the knee joint in the Sollas material. However, chop marks occur through the lower part of the shaft of the femur (Cut 7), through the shaft of the tibia (Cut 8) and (on the fore-leg) through the shaft of the radius (Cut 9) and of the metapodials (Cut 10). These are well represented and, at first, presented a considerable problem since sheep limb bones are small enough to have been processed as individual units: thus, a radius severed at Cut 2 and at Cut 5 does not require to be chopped in half Cut 9, and action which reduces each portion to a matter of a few inches in length. In the absence of any other evidence to the contrary, it is suggested that this mid-shaft fracture was made in the extraction of marrow, after disarticulation, and possibly also after cooking. Many of the metapodia are split at either proximal or distal and while this may well be for marrow extraction it must also be remembered that metapodia are potentially the most suitable bones from which to make many bone tools and utensils.

Most vertebrae identified from the site showed evidence of having been cut down the length of the spinal column and had been cut through the transverse processes: ribs often showed signs of having been cut through below the head, with either an axe or a sharp knife. Cranial fragments of sheep were so few that it is not possible to determine whether or not the skulls were chopped into, in order to reach the brains. An atlas has a transverse chop across the cranial end (Cut 11), suggesting that the carcass had been decapitated by an axe blow between skull and atlas, but there is no

additional evidence to support or refute this impression, except that a mandible had apparently been separated from the cranium by cutting through the ascending ramus of the mandible, presumably by hacking downwards and outwards from the open jaw (Cut 12).

Thus it can be reasoned that the stages of preparation and butchery evidenced upon the sheep bones at Sollas are (not necessarily in this order):

- 1/ animal skinned and detached at metapodial/phalangeal joint, or possibly at carpals/tarsals
- 2/ pelvis split and each hind- quarter detached from spinal column; disarticulation at hock
- 3/ fore- limb dismembered at 'shoulder', 'elbow' and probably 'wrist' joints
- 4/ at this point the viscera could be removed and the thoracic cavity cut up into loin, rib cage and head, ready for further processing and cooking.

The evidence for the butchery of cattle from Sollas shows basically the same features as for sheep, although the evidence is more scant and the joints are cut into more fragments, due to their larger size. There is clear evidence of skinning at the mid-metapodial, where the cutting marks across the back of the bones 'skip' over the channels for the tendons, indicating that this took place while the tendons were still in situ (Cut 13 on Fig. 15). Marks on the phalangeal/metapodial joints and on the phalanges

themselves may be examples of stripping taken to a lower point (Cut 1), but the chopping of a few phalanges may represent marrow extraction (Cut 14). The fore-limb is disarticulated at the scapula/humerus, either by cutting ligaments (Cut 3) or by chopping through the neck of the scapula (Cut 4); at the 'elbow' joint by cutting through ligaments (Cut 6) or by chopping through the weakest point on the humerus shaft (Cut 5). Radii were too poorly represented to present any evidence for butchery, but disarticulation at the carpals is clearly represented (Cut 2). Metapodia are consistently chopped through, both horizontally and vertically (Cut 12), presumably for marrow extraction, although it must be remembered that the metapodia are potentially the most suitable bones from which to make many bone tools and implements. The hind-limb is separated from the vertebral column by cutting through the acetabulum and/or through the ilium (Cut 7 and Cut 8). Mid-shaft fracture of the femur (Cut 9) and of the tibia (Cut 11) are represented, although whether for marrow or to process into suitably sized joints it is impossible to say. Cuts around the 'knee' joint suggest some possible attempt at disarticulation, but may merely represent removal of meat from the bones (Cut 10).

The evidence for butchery patterns regarding the other species represented at Sollas is too scant for consideration.

Fragmentation analysis was also conducted on the bones from WH/A, the pre-WH/B midden and the post-WH/B refill but small numbers of fragments made results invalid for all species except sheep. Table 35

shows that the percentage of unbroken sheep bones from the identified assemblage varies between 27% and 44% and is roughly compatible with the results obtained from the Udal analysis (Table 5). It must be remembered that in fragmentation analysis there is a high chance of bone being included in the count which has been broken accidentally after inclusion in the deposits.

No pattern of charred bone which might indicate cooking methods or meat preferences has been recognised from the site. Likewise, there is no clear distinction as to whether certain bones have been chewed in preference to others, although marks made by the teeth of canine animals have been noted on bones from the site.

The evidence of artefacts too may be taken into consideration: the worked bone from the site consists mainly of rather ambiguous objects, some of which might be interpreted as utensils for leather or fabric work and for decorating pottery, as hafting elements for tools, as furniture for rotary querns, as pegs (for supporting upright posts or for pegging down unknown roofing material into the supporting midden?) and as putatively decorative items. The recovery of two stone spindle whorls indicates textile production (as postulated from the faunal evidence), although no loom-weights or carding- combs were found. No querns were recovered in situ but the upper stone of a rotary quern was found to have been re-used as a kind of portable post-hole. The presence of iron slag shows that iron smelting was carried out at the site, and a fragment of one half of a bi-valve clay mould for a bronze ring- headed pin, together with

a small crucible, suggest but do not prove that bronze casting was also being practised.

Taking all the above evidence into consideration, we can then conceive of the wheelhouse site at Sollas as supporting an agricultural economy, based primarily on sheep and cattle (for meat, wool and dairy produce) with a lesser amount of pig. Drawing on modern and historic data, husbandry patterns can be proposed for each of these species which would seem to be the optimum economic solutions for the situation, and which are not contradicted by the archaeological evidence. The animals, as represented by the bones, appear to be almost disease-free, with a single example of arthritis (in the neck, not the feet as often found among animals from rocky terrain) and one of periodontal decay, which is regularly found among ruminants. Red Deer are the main wild species at Sollas, with birds and marine resources (fish, seal, crustacea and mollusca) available but not necessarily exploited. Comparative material from other wheelhouse sites in the Uists supports this picture. There is no evidence from Sollas for crop cultivation, except for the single, re-used quern stone. Metal is surprisingly well-preserved in this environment, but no agricultural implements have been recovered which would indicate arable production. Tools were manufactured from (presumably) iron and possibly bronze, as well as bone and antler. Whale bone was apparently a common raw material at the wheelhouse sites, presumably derived from beached whales, and may have been substituted for timber in building, as well as being utilized for smaller items.

Chapter 8.

A'Cheardach Mhor, Drimore, South Uist.

The Wheelhouse site at A'Cheardach Mhor was excavated in 1956 by the late Mrs. A. Young and Miss K. Richardson on behalf of the then Ministry of Public Buildings and Works, in advance of the proposed Rocket Range construction. Like the nearby site of A'Cheardach Bheag (half a mile to the south), the Wheelhouse lies on the machair plain on the west coast of South Uist where it appeared before excavation as a low mound 300 yards from the shore (Fig. 20). Today the location can still be traced but the building was backfilled and no features can be discerned within.

Excavations revealed 6 distinct occupation phases, separated from each other by blown sand, with the robbed remains of a Wheelhouse at the lowest level. The Wheelhouse itself comprised a slightly irregular-shaped structure of about 40' diameter with the interior divided into bays by 11 radial piers (only 9 remained). A pair of assymetrical curving walls formed a forecourt outside the entrance on the west side of the building and consisted of 2 sealed layers

containing a few finds, including the top stone of a rotary quern in the upper layer. The surviving piers inside the Wheelhouse were carefully built up to the main wall but not bonded in. The floor level in the bays contained much material, although not evenly distributed. Bay 1 contained the entrance to the building but did not produce much material. The other bays, some of them disturbed by later occupation, produced household refuse of bones, shells and sherds, a few "tools", evidence of rotary querns and possible quern handles, piles of beach pebbles, and lumps of clay which had apparently been prepared for some specific purpose. In some bays were found some possibly "ritual" features, particularly in Bay 5 where 32 cattle teeth were buried against the footing of the pier, and a large number of sheep long bones and mandibles were pushed vertically through the occupation level. The central area of the Wheelhouse was sealed by blown sand and revealed a level, hard-packed floor containing peat-ash but almost no finds. In the centre of the area, Hearth I was of red burnt clay, edged with pebbles and partially overlain by Hearth II which was lined with flat stones set in clay and also pebble edged, but which contained no ash. Six post-holes were placed radially around the hearths, two of them being made from the hollowed-out vertebrae of whales: this feature may have been to support some sort of canopy stretching from the piers to cover the inner area of the Wheelhouse.

Unfortunately it has not been possible to relate the faunal material to the stratigraphy with total certainty as not all the contexts accompanying the bones can be related to the final published

layer numbers (Young and Richardson, 1960) and the original site notebooks are not available. The bone from the occupation phases has fortunately been able to be distinguished, and the total site assemblage is listed in Appendix 3, in the hopes that eventually the stratigraphical context of all the material will be possible.

From the Wheelhouse occupation level (Phase I) the only faunal material now extant from Bay 5 consists of 1 sheep bone, and 10 teeth and 3 bones of cattle: the whereabouts of the possibly "ritual" features of this Bay (32 cattle teeth and many sheep mandibles and long bones) are unknown. From Bay 6 came a fairly large amount of bone: 7 teeth and 59 fragments of sheep bone; 5 teeth and 37 fragments (about a quarter of which are from neo-natal animals) of cattle; a single pig tooth; a single Red Deer bone; fragments of Cod and Pollack bones; and a bone from a Fulmar. Bay 7 produced only a piece of whalebone and a cattle jawbone. The material from Bay 8 contained 31 sheep bone fragments, 12 teeth and 8 bones of cattle, and a piece of antler. From the central area of the Wheelhouse were recovered 29 sheep fragments; 10 teeth and 14 fragments of cattle (including neo-natal bones); 3 teeth and 1 bone of pig; and 1 tooth, 1 bone and an antler fragment of Red Deer. Associated with a whalebone post-hole in the central area were a cattle tooth and bone, and a pig jawbone. From the forecourt were recovered a sheep jaw; 5 teeth and 5 bones of cattle; a half-skull/jaw and lower jaw of pig, of a comparable size to the RSM Sus scrofa specimen 446 and with slight periodontal decay; a tooth and 2 bones of Red Deer; and a Swan bone.

Phase IA lay about 2' above the level of the Wheelhouse entrance floor and comprised a rectangular hearth (Hearth IV), a few fragmentary stretches of walling, and a small midden dump. The excavator suggested that occupation was of short duration and occurred soon after the main occupation, to judge from the material recovered. Faunal evidence from this Phase consists of 3 teeth and 7 bone fragments identified of sheep, plus an apparently complete neo-natal lamb; 7 teeth and 3 fragments of cattle, of which one fragment compares closely in size with a modern Shetland cow (RSM specimen 1905-46); and 5 teeth and 2 fragments from a pig, which appears to have been a domesticate.

In Phase II the Wheelhouse was again re-used as temporary shelter and contained pottery comparable to that from galleried duns on Barra. Bones from this level consist of 3 sheep bones; 5 teeth and 10 bone fragments of cattle; a pig jaw fragment; a bone from a large dog, probably comparable in size to a modern retriever; a piece each of deer antler and whale bone; and a Puffin bone.

Phase III is represented only by short stretches of curving walls and by midden tips of peat-ash and occupation debris, including a quern-stone. Due to the pottery forms recovered, the excavator suggested a link with the builders of the island duns in South Uist and a date of 5th-7th Centuries A.D. Bones from this Phase consist of 6 sheep bones; 21 teeth and 13 bones of cattle; 4 teeth and 4 bones of pig; 3 bones and an antler fragment of deer; a jawbone from a small dog of terrier size, and an unidentifiable fish fragment.

Slightly more evidence remained of Phase IV where a semi-circular hut wall of robbed Wheelhouse stones and a few other disjointed stretches of walling contained very little occupation refuse, but was dated to around the 7th-8th Centuries A.D. by the excavator. The faunal assemblage mainly comprises 3 teeth and 23 bone fragments of sheep, with 43 teeth and 54 fragments of cattle. Pig is represented by 2 bones and 3 teeth, which seem to be from a domesticated animal. Deer is represented by 3 antler fragments, 2 teeth and 5 bones, of which 2 are slightly larger in size than RSM specimen 1981-68; and a single pony bone is comparable in size to the "Celtic pony" RSM specimen 1907-52. The assemblage is completed by a Gadoid sp. fish bone and a Gannet bone.

Phase V consists of greatly disturbed areas of mixed strata and finds and the material cannot be described as stratified. The bone material comprises 10 sheep fragments; 31 teeth and 36 fragments of cattle; 1 tooth and 4 bones of pig; antler fragments (including a cast burr), 2 deer teeth and a deer bone slightly larger than RSM specimen 1981-68; 4 teeth and 9 teeth of a pony comparable to the "Celtic pony" RSM 1907-52; a piece of whale bone and a human jaw fragment.

The material from phases III-V falls outside the chronological span of this thesis and will not be further discussed. The quantities of each species represented in phases I, Ia and II are summarized in Tables 36-39.

Chapter 9.

A'Cheardach Bheag, Drimore, South Uist.

The Wheelhouse site at A'Cheardach Bheag, on Drimore machair, South Uist was excavated by Dr. Horace Fairhurst in 1956 (Fairhurst, 1971). Like the neighbouring site at A'Cheardach Mhor (Young and Richardson, 1960), excavation was undertaken in advance of the proposed Rocket Range to be built in the area. After excavation the walls were levelled to avoid danger to grazing cattle and the site is now only a slight sandy hillock riddled with rabbit holes (Fig. 20).

The site comprised two wheelhouses and a complex entrance which overlay a furnace of an earlier date. The larger Wheelhouse, measuring around 30 feet in diameter, was divided into 12 bays by means of freestanding piers. Bay I contained the main entrance to the Wheelhouse, and a second doorway in Bay XI gave access to the smaller Wheelhouse II. Occupation material in the bays was contained in an 8-10" deep, brown laminated deposit, containing bones, shells, sherds, a few worked bone items, 4 broken quern stones and frequent small patches of greenish-yellow clay of uncertain function. The central area was covered by a compact layer of blackened occupation material and contained a complex hearth feature at the centre. This included an elliptical arc of at least 17 Red Deer mandibles laid out

in an overlapping fashion around the hearth itself. Since no other obvious function can be seen for this feature of unburnt jaws around a hearth, it is presumed that ritual practices dictated its presence. On the other side of the slab hearth there was an arc of large weathered stones set on end which may originally have been a complete circle. Apart from the hearths the central area was featureless with no evidence of post-holes, pits or stone sockets. Wheelhouse II was 17.5 feet in diameter and seemed to comprise 5 bays, although it was only possible to excavate half of the structure. No notable features were found. The entrance to Wheelhouse I seemed to show at least 3 stages of construction, culminating in "funnel-shaped" revetments leading into a narrow passage with an oval cell leading off. The entrance complex overlay (and therefore post-dated) a boat-shaped furnace but it was felt that the occupation material found in the latter could well be refuse deposited in the furnace after it had fallen into disuse. Disturbance had taken place this century, through the construction of a semi-underground shelter for a cow-herd, unfortunately located at the junction of the 2 wheelhouses.

Due to the small quantity of bone recovered from A'Cheardach Bheag, it is not possible to do more than glance at the species represented. Material from the 2 wheelhouses, the entrance complex and the furnace will be treated separately but no attempt has been made to distinguish levels within each context since:

"Various factors contributed to make difficult or impossible

the task of placing small finds in a time sequence from stratification alone. Periodic sweeping of the dwellings, overturning during secondary building operations, wind erosion of the midden material with its steeply sloping lenticular patches and an occasional rabbit burrow all combined to rob of much meaning the extraordinarily intricate banding revealed in some of the sections"

(Fairhurst, 1971 p.74)

Species represented at A'Cheardach Bheag are ovi-caprid, cattle, pig, Red Deer, horse, dog, seal, whale, bird and fish (Tables 40, 41 and 42). The single ovi-caprid horn-core recovered is from a sheep and there is no evidence for goat at the site. No horn-cores of cattle were recovered and the bones of the species were too fragmentary to allow any clear indication of size or possible breed. The 2 pig bones and 5 teeth from contexts at the site give no clue as to the role of the pig in the economy but the small size of the bone and maxilla and the nature of the 2 tusks recovered suggest domesticated animals. Red Deer is represented only infrequently in the deposits, with the obvious exception of the jaw- bone kerb around the hearth in Wheelhouse I. The mandibles represented here are almost totally from adult deer. The representation of the other species is too scanty for further comment here, although note must be taken of the quantities of burnt and unburnt whale bone fragments.

Faunal material from general contexts within Wheelhouse I

consisted of sheep, cattle, Red Deer, whale bone and a fore-limb of a small dog of small terrier size. The bays produced small amounts of bone of sheep, cattle, pig, deer, dog, whale, bird and a human fibula fragment. From the central area came a few sheep, cattle, pig, deer and whale fragments and the Hearth produced a few fragments of cattle bone and a single one of whale, as well as the kerb of Red Deer mandibles. The entrance complex to Wheelhouse I contained only a few fragments of sheep, cattle, pig, Grey Seal, bird and Gadoid sp. fish. The smaller Wheelhouse II produced only sheep, cattle, deer and a dog bone of similar size to that from Wheelhouse I ie. a small stocky terrier. From the furnace came only a Red Deer mandible.

Chapter 10.

Various sites in South Uist and Benbecula.

Over 30 sites are reputed to have been investigated in the course of the Rocket Range excavations in the Outer Hebrides in the late 1950s. Unfortunately, with the exception of Sollas, A'Cheardach Mhor and A'Cheardach Bheag, where details of the excavation were readily available in some form, most of these sites have now vanished without trace and no details can be found. Much confusion has arisen over the sites of Bruach Ban and Bruach a Tuath, largely due to the non-availability of the excavation notebooks and plans from 1956. In DES (1956) Bruach Ban is described as being a complex site "with the remains of at least 4 structures, of which 2 were aisled roundhouses, with considerable secondary occupation" (p.32). Bruach a Tuath is described in RCAMS (1928) as a wheelhouse (but recorded as an earth-house) and material from the site is illustrated by Lethbridge (1928, 1953, 1958-9). After correspondance with Mr. J. C. Wallace, excavator of Bruach a Tuath and consultation with Mr. R. Ritchie who administered the excavation of both sites, it seems that Bruach Ban and Bruach a Tuath are the names given to the individual wheelhouses described in DES (1956) as 'Bruach Ban' (p.32). Lying at the north end of the runway at Balivanich Airfield these two sites had been

deliberately bulldozed before excavation could take place, but some evidence for their location and structure still remains. At present the site report for Bruach Ban cannot be found, nor can the original maps on which the location and identity of all the Rocket Range sites were listed, but bones and small finds remain from South Uist 8, South Uist 9, South Uist 22, South Uist 24, Bruach Ban and Bruach a Tuath. An unpublished report of Bruach a Tuath has been found and forms the basis for our understanding of this site. The material from these sites has been considered as far as possible but, with the exception of Bruach a Tuath, the quantity and quality of the evidence is unsatisfactory and the remains from S.U.8, S.U.9, S.U.22 and S.U.24 will be ignored. They have been listed in this thesis only for the sake of completeness and in the hope that someday the relevant explanatory documents will be found and some context given to the material identified here.

Bruach a Tuath, Benbecula.

The Wheelhouse site of Bruach a Tuath lay on the north side of the airfield at Balivanich, Benbecula and was the remains of a mound removed by bulldozer during 1939/45 when the airfield runways were being constructed. Excavation was undertaken by the late Mr. J. C. Wallace from 27th July to 7th August 1956 on behalf of the then

Ministry of Public Buildings and Works. In the RCAHMS (1928) the site is described as "a mound of sand 13 feet high with kitchen midden refuse scattered over its summit and sides" but by the time of excavation the mound had been reduced to a flat expanse some 3 feet (0.915 m.) above the level of the airfield with only a few stones showing on the surface.

The only information regarding the excavation comes from a paper (currently held by the NMAS) which the excavator was working up for publication, and from a covering letter which was included with the faunal material. Since the latter points out that not all of the bone recovered had been saved for identification, the existing material can only be considered as a random sample from the site and will be discussed as such.

The site comprised a Wheelhouse, an integral souterrain and a circular stone feature consisting of a paved circle set lower than the stone kerb which ringed it. The purpose of the latter "platform" is unknown and produced only a few scraps of bone. From the entrance passage and the interior of the Wheelhouse were recovered fragments of sheep (8 teeth and 34 bone fragments), cattle (8 teeth and 32 fragments), pig (2 teeth and 2 fragments), deer (antler fragments) and whale. Unfortunately it is not possible to determine whether any material came from the hearths or from the pits and areas of heavy burning within the structure. The centre of the Wheelhouse was not fully exposed due to lack of time for excavation and a complete picture of the interior could not be gained. Likewise, the

souterrain was only cursorily examined and contained only fragments of sheep (3 fragments), cattle (a tooth and 3 fragments) and a bird bone. The quantities of the individual species recovered from the site are listed in Table 43.

Bruach Ban.

The neighbouring site of Bruach Ban also consisted of a Wheelhouse but no features can be discerned either inside or outside the structure since no information regarding the excavation can now be traced. Unfortunately the label contexts accompanying the faunal material shed no light on this problem either and consequently the assemblage must be regarded as a random sample. Excavation was carried out by Mr. and Mrs. J. G. Scott between 22nd-31st August 1956 on behalf of the then Ministry of Public Buildings and Works, after the site had been entirely obliterated by construction of the runway. Bones from the site consist of 17 fragments of sheep; 9 teeth and 15 fragments of cattle; 1 tooth and 5 fragments of pig; 3 foot bones and some antler fragments of deer, and some scraps of whale bone (Table 43).

South Uist 8.

The material from this site, the location and nature of which are unknown, consists of sheep (2 teeth and 6 bone fragments); cattle (6 teeth and 8 fragments); pig (1 fragment); deer (antler fragments only); bird and small mammal (1 fragment each).

South Uist 9.

Considerably more material is preserved from this unknown site, primarily of cattle (56 teeth and 53 bone fragments), with 13 teeth and 24 fragments of sheep; 3 teeth and 14 bones of pig; 10 teeth and 11 bones of horse; 1 tooth, 7 bones and some antler fragments (including a cast burr) of Red Deer, and 1 bone each from small mammal, whale, fish and bird.

South Uist 22.

The location and nature of this site are unknown at present but the faunal assemblage comprised 6 teeth and 31 bone fragments of

sheep; 20 teeth and 30 fragments of cattle; 13 bones and some antler fragments from deer; 4 teeth and 14 fragments of pig; 2 horse teeth; 2 bird bones; a fish bone and some (intrusive) rabbit remains.

South Uist 24.

This site (location unknown) was described by the excavators Mr. and Mrs. J. G. Scott as "probably representing merely squatting against a sand dune, with possibly a hearth, but producing considerable remains of bones, as well as shells and potsherds" (pers.comm.). The bone material consisted of 9 teeth and 106 fragments of sheep; 3 teeth and 5 fragments of cattle; 3 pig fragments; some antler fragments including a skull/antler portion; and the ubiquitous, intrusive rabbits. The site, dug from 14th-16th August 1956 was considered from its material culture to be contemporary with Bruach Ban.

SECTION III. Discussion.

Chapter 11.

Faunal resources from the Outer Hebrides in prehistory.

As discussed in Chapter 1 variation in quality and extent of excavation and post-excavation work makes it difficult to assess the economic and settlement patterns of the prehistoric inhabitants of the Outer Hebrides and the resultant outlines can be rather blurred in places. Before an overview can be made it is important to consider the nature of the stock animals and wild resources upon which the interpretation will be based, in order to give some idea of the characteristics, availability and potential value of each species represented in the archaeological record. To some extent this has been covered in the individual site chapters but the evidence will be summarized here in order to aid in the economic assessment.

As has been noted already in the individual faunal reports, sheep and cattle from prehistoric sites in the Outer Hebrides seem to be of a standard type, irrespective of chronological or geographical location. The sheep represented by the excavated bones appear to be small, slender-limbed animals, similar in skeletal proportions to modern examples of Shetland sheep (Figs. 5-10) although the Iron Age assemblages include examples closer to the Soay sheep in size. Examination of the sheep horn-cores recovered revealed that most of

them were of an oval cross-section and were slightly curved along their lengths with no torsion evident. Since mensurable examples were few, the relationship of length to basal circumference could not be shown to be either uniform or variable across the range of sites studied.

The cattle bone recovered from all sites indicates a small, stocky type, similar in skeletal proportions to an example of a 'Celtic Ox' in the reference collection of the Royal Scottish Museum (RSM 1905-46). The only exception to this pattern is in the Neolithic layers at Northton, where 2 cattle 1st phalanges are considerably longer than any other cattle 1st phalanges identified for the purpose of this thesis: none of the few other cattle bones measurable from this layer seem especially large. Ryder (1968) points out that the first change in sheep following domestication was the shortening of the leg bones with the result that primitive domestic sheep were not as tall as their wild ancestors. It seems likely that cattle, another ruminant, would react to domestication in the same way and this may be the explanation for the longer 1st phalanges in the Neolithic layer at Northton. It is interesting that the Neolithic sheep bones recovered are in the upper area of the size distributions (Figs. 9 and 10) indicating longer leg bones in the animals from which they derived. Examination of the cattle horn-cores was originally conducted using the scheme devised by Armitage and Clutton-Brock (1976) and on this basis, the majority of the adult and sub-adult horn-cores can be classified as 'short-horned'. Further adherence to the details of this classification suggested that the majority of the cores had come

from bulls, a proposal which not only seems like economic suicide but which is also totally unsupported by the post-cranial bones recovered. It is suggested that this classification may be inappropriate for prehistoric cattle in the Outer Hebrides and that a full study of the age and sex variations of 'unimproved' cattle (and sheep) under similar environmental conditions would be invaluable for future research. Clarke (1959-60) recognized some age and sex differences among the South Uist wheelhouse material, with most of the cores pointing forwards and downwards, in contrast to a single core which was not only longer but also twisted upwards and forwards. The latter he interpreted as being from a cow, the former from bullocks or young bulls. Clarke's distinction is supported by study of the cores from all the sites considered in this thesis but it must be emphasized that without a modern comparative study firmer conclusions cannot be drawn.

It seems likely that sheep and cattle were introduced into the islands at the beginning of the Neolithic period (or during the Mesolithic for which virtually no evidence survives in the area) since there is no evidence for wild progenitors of either species. However, the slightly longer leg bones from the Neolithic level suggest that domestication may still have been fairly recent when the animals were introduced to the islands and it is frustrating that a larger sample is not available.

The situation regarding pig is problematical since wild boar is suggested from the Neolithic layer at Northton. However this is not a

secure identification since it is based on a single pig tusk which exhibits characteristics generally ascribed to wild boar but which could conceivably have come from a domesticated boar instead. Post-cranial bones from all of the sites under discussion are fairly small and are assumed to have originated from domesticated animals. It is regrettable that larger samples are not available in order to determine whether wild pigs were present on the islands in prehistory and it is to be hoped that future excavation will resolve this.

Evidence for domesticated dog has been recovered from every period under study in this thesis and the remains indicate several sizes of dog, with no apparent increase or decrease in stature with time. The dog bones recovered have been roughly classified into three groups, based on comparative material: 'large' indicates a dog around the size of a modern retriever, 'medium' indicates a dog between the sizes of a modern whippet and a collie, and 'small' indicates a short, stocky dog with closest parallels in modern West Highland or Scottish terriers. From the Neolithic contexts at the Udal came evidence of a medium dog while material from the Beaker levels at the same site suggests a small animal and both sizes are present in the Early bronze Age layers. From the Early Wheelhouse deposits were recovered evidence of a medium dog and a neo-natal puppy of indeterminate group. The later Wheelhouse/Squatter layers at the Udal produced bones of a small dog, similar to that recovered from A'Cheardach Bheag. A large dog was identified from A'Cheardach Mhor and from Sollas came evidence for both a large dog and a medium one. This random scatter of sizes among the layers and sites may indicate that no deliberate breeding of

dogs for specific characteristics was practised in the Outer Hebrides in prehistory. On the other hand, it may equally well indicate that a variety of breeds already existed in the Outer Hebrides by the end of the Neolithic period. Thus the largest dog can be seen as a hunting dog, particularly suitable for the pursuit of deer. The medium-sized type, of roughly comparable size to a modern sheepdog, can be envisaged as having served that function in prehistory, aiding flock management in the movement between grazing areas. The smallest dog could perhaps have had a role in the herding of cattle, since small, alert terriers are adept at harrying cattle along by running behind them and occasionally delivering a well-aimed nip at the hind feet: in this capacity they are sometimes still seen today. There is no evidence from any of the deposits for the use of dogs as meat and it is presumed that they were accorded a special status among the fauna at the sites. From the area as a whole we have a suggestion that several breeds or types of domesticated dogs were in existence in prehistory, whether as an accident of natural selection or, as seems more likely, through the intervention of man and his attempts to produce animals to aid him in specific activities.

Harcourt (1974) has found that dog bones from Neolithic and Bronze Age contexts show a single population with little variation: these appear to be medium-large animals. By the Iron Age there is an overall reduction in height but the smallest dogs are still in the minority. This, he suggests, is due to their introduction only towards the end of the Iron Age. The limited evidence from the prehistoric sites in the Outer Hebrides suggests that, for this area

at least, Harcourt's findings are not applicable and the trend, if any can be said to exist, is more towards the development or introduction of the largest size of dog in the Iron Age. Perhaps Zeuner's derivation of three types of prehistoric dog from the original domesticate (1963) better suits the evidence from the Outer Hebrides.

In a wider context, examples of all three sizes of dog recognized in the present work can be seen elsewhere in prehistoric Scotland. For example, the complete skeleton from the neolithic midden at Nether Kinneil, Stirlingshire could be identified as a male of around 18 months of age, similar to a modern pointer in stature (Finlay, in prep.). At the other end of the scale, a small terrier-sized dog was noted from the Late Bronze Age/Early Iron Age phase at Jarlshof, Shetland (Platt, 1956). To take the comparisons further afield, attention is drawn to the Iron Age oppidum of Manching, Bavaria where all three sizes of dog were represented (Oberdorfer, 1959).

Only a few fragments of horse bone are represented from the range of sites discussed in this thesis. None of the fragments gives any indication of the stature of the animals from which they came, but the presence of pony bones in Phases IV and V at A'Cheardach Mhor suggests that the earlier equids may have been similar to these. The earliest indication we have of their presence in the Outer Hebrides is in the later Beaker level at Northton, although this does not preclude their presence in the area previously. The species must have been deliberately introduced as a domesticated animal since again there is no reason to suspect that it was indigenous to the area. Its value to

man as a mount, pack animal and traction is obvious and needs no elucidation here.

Red Deer is represented throughout the periods at all sites considered in this thesis and can be seen as a constant, if not staple, source of food and raw materials. Today the main herds of deer are concentrated on the uplands of Lewis and Harris, with smaller herds in North and South Uist. The archaeological evidence suggests that this situation may have prevailed in prehistory also, since by far the greatest quantities of Red Deer bone have been recovered from all the layers at Northton. While allowances must be made for the possibility of sampling bias or differential exploitation of the species through time, it is interesting that the same situation does not obtain at the Udal, just 2 kilometres across the sound of Harris from Northton. All of the deer bones measured indicate animals of a comparable size to modern moorland specimens.

Fragments of seal bone are found occasionally throughout the sites under discussion, from Grey Seals and Common Seals. Both species are populous in the seas around the outer Hebrides and represent a potential source of meat, oil and seal-skin to the hunter. The Common Seal spends almost all of its time at sea, coming ashore only very rarely since it can mate and give birth in the water and the pups can swim efficiently from birth. The larger Grey Seal comes ashore to give birth and mate in the autumn and in spring to moult, and the pups do not take to the sea for around three weeks after birth. This makes the Grey Seal more vulnerable to the actions

of man since they are slow-moving creatures on dry land and can be clubbed to death, thereby obviating the necessity for pursuit by boat. Where determination of species can be made from the archaeological fauna recovered, Grey Seal bones are three times as numerous as those of Common Seal, and nearly half of the Grey Seal bones are from juveniles. This suggests that the exploitation of seal in the Outer Hebrides in prehistory was largely, if not indeed exclusively, seasonal and occurred in autumn.

All the prehistoric sites studied in this thesis have produced quantities of whale bone, whether worked or merely in amorphous chunks. This would have been an extremely valuable resource in an unwooded landscape where quality driftwood was insufficient in quantity for all the demands made upon it: whale bone would serve just as well as wood in most cases. The variety of species which have been identified is wide: Pilot Whale, Killer Whale, Lesser Rorqual, Sibbald's Rorqual, Bottle-nosed Whale, a Balaenopterid and a dolphin or porpoise. Such variation suggests no specific target species and it is possible that stranded whales could have been the source of this material. For example, modern records show that between 1927 and 1966 twenty-four Cetacea were reported stranded on the coasts of the Outer Hebrides, an average of about one every two years and there is no reason to presume that strandings should be any less frequent in prehistory. Clark (1947) postulated the hunting of whales in the prehistoric period but pointed out that some species could be more easily pursued than others prior to the invention of the harpoon gun in 1865. Historic records indicate the hunting of the Pilot Whale in

particular where an individual or a group was headed off from the open sea by boats, herded into a chosen inlet and driven ashore. This practice was carried out in the faroes, Orkney, Shetland and the Hebrides in general and Crawford (pers.comm.) indicates that early prints depict the activity on the Uist coasts.

There is no doubt as to the economic value of the whale to a small community: flesh and blubber are important sources of food and light, skins can be used as leather for clothing or boats, and bones have a multitude of purposes from constructional components to raw materials for vessels and implements. Bones can also be used as fuel, as in the Faroes at the turn of the present century, where fresh whale bones were burnt instead of peat (Annandale, 1905) and this may perhaps explain the quantity of burnt whale bone, particularly at A'Cheardach Mhor, which Clarke (1959-60) felt "may have served some utilitarian purpose in the hearth".

The quantity and variety of bird bone varies between periods and sites, sometimes to an astonishing degree. While the quantities of bird bone from the Udal (where all spoil is sieved) generally increase from Neolithic through to Late Wheelhouse/Squatter levels, that from Northton (where sieving was not conducted) shows a general decrease over roughly the same time span. In the same way, there is a fair quantity of bird bone identified from Sollas but only a few fragments from A'Cheardach Mhor and A'Cheardach Bheag. It is to be expected that variation in recovery methods would be most clearly shown in small bones, such as bird and fish remains, which are most easily

overlooked in hand collection during excavation, so the lack of these remains at sites where no sieving was done is not surprising.

The majority of the identified bird bones from all the sites are from aquatic birds, mainly those with a marine habitat (19 species). Few juvenile bones were noted, giving no evidence for seasonal collection of the young. None of the marine birds identified would be out of their natural range today, with the exception of the Great Auk which has now been extinct for a century. This flightless species is found consistently among the remains from the sites studied here and obviously represents a deliberate and repeated choice of prey. It was described by Martin in 1698 as coming to St. Kilda on May 1st and leaving again in mid-June: this suggests that it may have been a summer visitor to the area but unfortunately too little is known about the species to be sure. Marine birds furnish a rich source of oil or grease, some bear a usable amount of down and all are edible so it is not surprising that they are so well represented in island communities. The example of the Gannet is well known, where the species was a traditional item of food on St. Kilda in historic times and was replaced by the Fulmar as the staple diet in the Eighteenth Century AD.

Nine species of waders have also been identified from the sites and again these are birds which are today resident in the area for at least part of the year. These could be captured by setting limes or snares, or by shooting with arrows or stones, as opposed to many of the marine birds which would frequently be taken by climbing to their

cliff habitats to kill them. Waders would provide meat and their long, slender legs would make ideal raw material for implements.

Thirteen species of passerines and associated types have been recognised among the remains, including a comparatively large quantity of Starling bones. The small birds could be caught by limes and snares and would presumably provide a further variation in food, although the quantity of meat obtained from each one is almost negligible. It is also possible that they were captured for feathers rather than for food.

There are a few species represented among the bird bones which are not common in the islands today. The Little Auk is an irregular visitor and presumably was so in the later Beaker period at Northton too, since that is the only occurrence of it in the sites under study. The Stork is by contrast extremely rare in the area and represents only a vagrant, to judge by the range of the species today, but an example is recorded from the later Beaker and the later Iron Age periods at Northton. The Goosander identified from the earlier Beaker level at the same site is known from the west coast of Scotland at the present day and presumably is again a vagrant in this instance. The most obvious anomaly to the present-day bird distributions is the presence of Black Grouse at Sollas and in the Late Wheelhouse/Squatter levels at the Udal. Since the modern distribution of the species does not extend to the Outer Hebrides, it is likely that either some examples had been blown over from the mainland or Islay and Mull where they exist today, or that they had been brought over through human

intervention, or even that they were once resident in the area.

The rich variety of bird species identified suggests that birds played a valuable, if varied, part in the economy of the prehistoric communities, whether for food, feathers or raw materials. No distinctions are seen regarding the choice of species in each level, except to note that at the Udal passerines only seem to have been utilized to any extent in the Wheelhouse and Squatter phases. The Outer Hebrides is still noted for its abundant bird life today and a similar situation appears to have existed in prehistory.

Fish bone is poorly represented at most of the sites under consideration, with the exception of the Udal where the material was sieved: the imbalance is therefore taken to be one of recovery rather than economy. The species represented are few but consistent: Conger Eel, Ballan Wrasse, Mackerel, flatfishes, cartilaginous fish (sharks and rays) and, by far the most frequent, members of the cod family (Cod, Ling, Pollack, Saithe, Haddock and Whiting). These species are all still common in the area today and represent a rich potential for food, oil and fertilizer. The majority of the archaeological specimens recovered were probably caught from boats, since they are off-shore species; however, smaller examples are represented (particularly from gadoids) and these could have been caught by line from the land. Mackerel are a migrant species in the area, appearing off the Hebrides from July to September but the other species are available at all seasons. The only unusual species found at any of

the sites were an uncertain identification of a Sculpin/Bullhead from Sollas, and an unidentified skull from the Early Bronze Age horizon at the Udal which may eventually prove to represent a vagrant to the area, or even a species not found there now.

Shellfish must also be considered as an exploited resource since large quantities are known from all archaeological sites in the Outer Hebrides. Cockles, periwinkles, scallops, whelks and mussels and less frequently razorshell and oyster have been recovered from excavation and today these species are still gathered at low tide along the coasts of the islands. It is felt that shells are sufficiently represented throughout the area and period to be regarded as food debris but of course the shellfish could have been used in other ways also. Within living memory it was the custom in the Orkneys to employ semi-masticated limpet 'meat' to bait fishing hooks and the unpleasant flavour and texture of this species, which is found in such profusion in the shell middens of the Northern and Western Islands of Scotland throughout prehistory and later, may indicate that the marine mollusca recovered from the Wheelhouse sites may not be solely dietary in purpose.

Overall, the fauna recovered from excavation in the Outer Hebrides show little change in type or character of species throughout the prehistoric period. Domesticated stock are of standard types which seem to vary little through time and which were introduced to the islands after domestication, with the possible exception of the pig for which the evidence is inconclusive. Wild resources

represented are still available in the area today, with the exception of Badger, Black Grouse, Great Auk, and the unidentified fish skull from the Udal, and the present ecological potential seems largely similar to that in prehistory.

Chapter 12.

Prehistoric settlement and economy in the Outer Hebrides.

In the preceding chapters consideration has been given to the archaeological, geographical and ecological situation in the Outer Hebrides in prehistory. The methods of faunal analysis used in this work have been outlined and the basic economy of the site, as evidenced from the faunal remains, has been indicated. Now it is essential to draw together all the available strands of information to establish the economic and settlement pattern of the area as a whole at any given point in prehistory and to determine whether any trends evident within the area and period are due to chronological or topographical location. It must be noted that the nature and quality of the information pertaining to the sites is variable, and not only with regard to the faunal evidence. For the South Uist wheelhouse sites information was available only through the published reports and specific queries or anomalies must remain unanswered. Some items of the Northton faunal assemblage which were listed soon after excavation are no longer available for study. Even for the Udal the situation is not wholly satisfactory, partly because the middle of the chronological sequence remains to be excavated, but also partly because preparation for publication of the excavations of the historic periods at the site means that the excavator is not yet fully involved

in the post-excavation analysis of the prehistoric material. Thus many details which might be of value in the present study remain to be extracted from the vast amount of information and finds which the excavations have generated: this situation will, of course, be rectified in the foreseeable future. In the following assessment of the Outer Hebrides in prehistory it must be remembered that quantities of stock animals mentioned are minimum estimates only and are to be regarded more in a comparative sense than as actual numbers of specimens represented. It is well accepted that the real number of animals originally present at the site is probably well in excess of the MNI estimates calculated. Where the archaeological record is defective, the most logical explanation of a feature or trend will be suggested and it is hoped that future excavation and research may clarify the point.

Neolithic settlement and economy.

Evidence for the economic situation of Neolithic settlements in the Outer Hebrides is available from only two sites at present. At Northton Simpson (1976) interprets a short length of rough dry-stone walling and a general scatter of stones and boulders, interspersed with patches of burning and unfired clay, as evidence of occupation. This is certainly supported by the faunal evidence which represents at least 9 sheep and 7 lambs, 4 cattle and a calf and some hunted animals, namely Red Deer, seal, birds, fish and perhaps wild boar. Shellfish were extensively collected. Simpson (ibid.) suggests a

similar domestic function for the site of Eilean an Tighe in North Uist (Fig. 1), where similar structural features were originally interpreted as the remains of three kilns (Scott, 1950-51), but where the absence of wasters among the large number of sherds recovered does not indicate a concentration on pottery manufacture. There is no bone extant from Eilean an Tighe which is the only other non-funerary or non-ritual Neolithic site currently known from the Outer Hebrides with the exception of Northton and the Udal.

The series of ovoid structures at the Udal were shown to be in chronological succession and were almost complete in ground plan, including internal features such as hearths, post-formations and drains. The fauna associated with these buildings appear to be a minimum of 10 sheep and a lamb, 3 cattle and a calf, a dog and some evidence for hunting, fishing, fowling and the collection of shellfish. There is no excavated evidence from either the Udal or from Northton for cereal cultivation, in the form of charred grains, impressions on pottery, agricultural implements or querns and the flotation of the floor deposits from the Udal houses produced no cereal seeds. This suggested to Crawford (1980), as it does to the present author, that "a pastoral economy seems indicated."

At neither site is there evidence for any extension of the settlement beyond the structures (ie. enclosures or contemporary ancillary buildings which might denote farming practices): at Northton this may be due simply to the limited excavation possible, while at the Udal it may be due partly to the fact that coastal erosion has cut

deeply into the site and partly to the fact that excavation is still in progress. Each structure appears to have been an individual dwelling since each contained 'domestic' refuse in the form of bone and pottery fragments, and the Udal houses exhibited 'domestic' internal features. To judge from the Udal structures each building could have housed a single family, and possibly several generations in the successive constructions, but it is not possible to determine the length of time for which the structures were in use and the rebuilding at the Udal could have been conducted within the residency of the same group at the site. The fauna identified from the Neolithic contexts do not suggest that they were occupied on a seasonal basis only, and occupation is assumed to have been permanent.

On the available evidence, the economic system in operation in the Outer Hebrides in the Neolithic period appears to be one of pastoralism and hunting/gathering, based on a family unit, with no development of arable production. The management of a few sheep could provide meat and dairy products, a pattern supported by the bone evidence from the period which suggests periodic culling of an animal for food. Wool would also be available, although the present author knows of no evidence for textile production in the form of loom weights, spindle whorls or carding combs from the sites. In modern Uist sheep are grazed on the machair outfield over the winter and they lamb there. They are brought up to the crofts in May and are later put out on to the upland until around November when they are again brought down to the machair (Crawford, pers.comm.). Crawford also points out that until fairly recently each township had a full-time

herdsman who moved with the flock, and he feels that this is a very longstanding arrangement. Certainly this system of sheep husbandry could equally have applied in the Neolithic period, with selected members of the group accompanying their flocks to the summer pastures.

The keeping of fewer cattle than sheep is understandable since they require more individual attention than sheep. They would, however, provide additional meat and dairy products. Because cattle are less economical in meat terms than sheep (since their meat value is realized less frequently but in greater quantities) unless some form of co-operation is employed between neighbouring groups, the slaughter of a bovid involves a great deal of work in the preservation of the meat. Today in the Uists cattle are generally overwintered around the croft and put on to the hill in summer, and again this is a logical pattern of land utilization which could equally have been practised in the Neolithic.

Stock management may have been aided by dogs, domesticated throughout Europe long before the Neolithic period. The medium-sized dog recovered from the Udal is the only evidence for the species in the Outer Hebrides at this time, and resembles a modern border collie in stature and may have played a similar role.

Other requirements for food and raw materials could be met by the pursuit of deer and possibly boar, by fishing (probably from a boat since most of the species represented are off-shore types), by fowling and by the collection of bone, oil and blubber from stranded whales.

None of these resources are present in a great enough quantity to indicate a regular contribution to the economy and the main emphasis appears to have been on the stock animals. However, the importance of shellfish, predominantly cockles in this horizon indicates an additional source of protein and a variation in the diet.

The above evidence and interpretation supports a hypothesis of the existence in the Neolithic of small groups of pastoralists who built apparently permanent habitations and practised lithic, pottery and bone-working technologies.

Beaker economy and settlement.

Evidence of settlement and economy is as lacking for the Beaker period as it is for the Neolithic and while a whole series of sites are known down the west coast of the Uists because of the Beaker sherds eroding out of them (Crawford, pers.comm.) details are known from only three. Of these, Rosinish has not been considered in detail from the faunal aspect as previously explained (Chapter 6), but its structural and artefactual characteristics must be included. Dalmore in Lewis (N. Sharples, pers. comm.) appears to contain Neolithic and Beaker levels but information regarding the site and its faunal remains became available too late to be included here.

Two dry-stone structures were discovered in the earlier Beaker midden horizon at Northton, the better-preserved being oval in plan

and containing 2 occupation levels (including a hearth and an internal pit) separated by sterile sand. Beneath the lower floor was a series of stake holes roughly lining the walling and these Simpson (1976) interprets as evidence for a light hut or tent, dug into a pit to provide semi-subterranean shelter, and protected by a revetment wall. He also alludes to the possibility of a skin boat being used as a roofing structure, after Case (1969). The domestic fauna associated with this structure represent at least 5 sheep and a lamb, 3 cattle (including a massive specimen taken to be from a bull) and a calf, and perhaps a pig, since it is not possible to tell whether the suid identified is of wild or domestic origin. There appears to be a marked increase in wild resources by comparison with the Neolithic period with at least 7 Red Deer, 10 species of bird, 4 of fish and sundry remains of seal, badger, otter, crustacea and shellfish recovered. The only structure in the upper midden at Northton is a corbelled inhumation cist but the associated fauna from the midden appears to represent domestic debris. Remains of at least 2 sheep and a lamb, a bovid, a pig (probably domesticated), a dog of unknown size or type and a single tooth indicating the presence of a horse or pony at the site comprise the domesticated species and there is very little evidence regarding the exploitation of wild species.

At Rosinish a U-shaped stone structure may have been similar in construction to the Northton house and a beehive cist is of the same form as examples at Northton and the Udal. Ard-marks were found in some profusion on the subsoil beneath the old land surface upon which the Rosinish midden had developed and Shepherd (1976) was also able to

detect possible spade marks. Similar features have been detected at the Udal and ploughing was also recognized in this phase at Callanish in Lewis (Ashmore, 1980).

Repeated ploughing is a distinctive feature of the Udal Beaker deposits also and there the layer contains numerous large stone-lined pits of approximately uniform size. These are suggested as being for burial purposes (Crawford, 1981) although, until closer study is made of them, they could also be interpreted as storage pits. Fauna from the Beaker contexts at the site consists of at least 3 sheep, a calf and an adult bovid, a pig and a small breed of dog, with evidence for the procurement of deer, seal, bird and fish.

As previously mentioned, repeated ploughing is present in the Beaker horizons at the Udal and at Rosinish. At the latter site fine wet-sieving revealed carbonised grains of barley and oats, giving more detail as to the nature of the cultivation. Since no sieving was carried out at Northton, it is not possible to be certain that no cultivation was undertaken there but the excavator argues that the absence of milling equipment and of grain impressions on the large amount of pottery recovered from the two Beaker levels supports this conclusion (Simpson, 1976). Molluscan evidence indicates a phase of prehistoric forest clearance at Northton, securely associated with the Neolithic and earlier Beaker phases (Evans, 1971), followed by a phase of woodland regeneration during the Beaker II occupation which in its turn was succeeded by a second phase of clearance. Cowie (pers.comm.) points out that this theory is flawed by the uncertain habitat

preferences of some of the prime snail species upon which the sequence is based but, in any case, given the lack of cultivation evidence, any clearance effected at this time was probably for pasture.

As in the Neolithic period there is no evidence for enclosures or ancillary buildings at any of the sites being considered and the rather ephemeral structural remains do not concur with the modern view of a permanent residence. Nevertheless, the presence of repeated cereal cultivation in North Uist, Benbecula and Lewis suggests at least some degree of permanency, whether on a cyclic basis or on a sedentary one. The faunal evidence gives no indication of strictly seasonal use of the sites and there seems no reason to postulate any.

The available evidence suggests a dichotomy in the economic practices of the Outer Hebrides as a whole in the Beaker period. At the Udal a pattern of animal husbandry of apparently similar features to that of the preceding Neolithic phase is supplemented by the introduction of cultivation. Utilization of wild resources does not, however, seem either to have diminished or increased from the previous situation. The animals identified from Rosinish support this picture and the recovery of barley and oats (Both still important crops in the area today) indicates the nature of the cultivation. In contrast, there is no evidence for cultivation in either phase at Northton, where the expansion in time and energy represented by cultivation at the Udal is expressed in the utilization of wild resources, particularly in the hunting of Red Deer. Since it is infinitely easier to collect cast antlers at the appropriate time of year than to

hunt down stags to get them, it is presumed that aquisition of antler was not the main reason for the interest in the species at this time. It would seem more likely that venison, or even enjoyment of the pursuit were the prime objectives and that antler and bone for tool-making were useful by-products. The presence of a horse or pony in the upper horizon may be connected with the increased interest in hunting, since a rider would have a considerable advantage over a pedestrian hunter. The equid could also have served a function as a pack animal or been used for traction. This is the first known occurrence of the species in the Outer Hebrides and it is unfortunate that a greater quantity of the remains has not been recovered. The dog represented in the same layer may have had a role to play in hunting as well as in more agricultural pursuits. Sheep and cattle appear to be of similar importance in the economy of both Northton and the Udal as previously and there is still no artefactual evidence for secondary products known to the present author. Cattle would surely assume a more important role with the introduction of cultivation when harnessed for traction, but there is no evidence from the bone material studied for the development of traction animals.

The increased importance of wild species in the Beaker layers at Northton is not restricted to deer by any means: seal-skin may have been used in clothing manufacture and the meat would certainly have been eaten. The bird species represented in the horizons are almost exclusively marine in habitat, providing a rich source of oil, as well as meat, feathers and bone (for implements). The fish species recovered could have been caught either inshore or from a boat. Of

particular interest from the earlier midden are skull fragments of badger and otter. These may have been caught for food but since the remains are exclusively from the head region it is quite possible that the examples recovered were prepared as pelts, with the skulls preserved within the skin - rather in the fashion of a tiger-skin rug in more recent times. The wild species identified from Northton show no evidence for seasonal occupation and the quantity of material represented suggests permanent occupation by a small (family) group as in the previous period, involved in pottery production, an impoverished local lithic industry and possible bronze casting.

The apparent continuity of economy and the smooth introduction of cultivation at the Udal between the Neolithic and Beaker periods is in sharp contrast to the sudden importance of wild resources in the earlier Beaker horizon at Northton and the lack of evidence for any cultivation throughout the Beaker period at the site. This is of particular interest since, throughout Britain and Europe, the advent of the Beaker period is marked by a superficially sudden introduction of a new pottery style and recurrent associations of artefacts. As Burgess (Burgess and Shennan, 1976) points out there are no signs of a common social or economic system, no uniform settlement or house types, no standard ritual or burial traditions accompanying the artefacts. Upon closer examination it becomes obvious that "Beakers frequently occur not in distinctive Beaker contexts but fit comfortably into the local setting" (ibid., p.309). This is certainly the case at Rosinish where Shepherd found no stratigraphical distinction between the greater quantity of 'Beaker' forms and the

small proportion of sherds "which, if found in isolation, would appear to be closer in character to local late Neolithic styles" (Shepherd, 1976, pp.212-213). The same types of pottery appear to be represented at Northton also, and bone combs for decorating Beakers were recovered from the site. The evidence regarding Beaker settlement in the Outer Hebrides certainly indicates that settlement groups only a few kilometres from each other could be subject to totally different influences in some aspects, while obviously open to similar ideas in others: this is taken to indicate contact through trade or similar networks with the mainland or further afield. Thus, while the same pottery traditions are represented at Rosinish and Northton and presumably at the Udal, two different economic regimes were in operation among the groups involved.

Bronze Age settlement and economy.

The only evidence for Early Bronze Age economy and settlement in the Outer Hebrides comes from two superimposed house structures at the Udal, associated with a large midden and with a cairn cemetery and a 'ritual' enclosure. The same economic system is evident as in previous periods at the site, with at least 6 sheep and a lamb, 2 cattle and calves, a pig and 2 different types of dog representing the domesticated stock. The medium-sized dog may well have been used to assist with the sheep, and the smaller with the cattle but either may have served a different function, or simply been pets or watchdogs.

Hunting of deer and seal was of little importance in the economy but fishing and fowling was evidently valued for food, feathers, oil and bone (for tools).

As before, the evidence points to a subsistence pattern based on a small family group, interested primarily in stock-rearing but also willing to take advantage of wild resources. No information regarding cereal cultivation is known to the present author but it is presumed that this was still practised in continuance from the preceding period at the site. Again there is no evidence for outbuildings or enclosures associated with the dwelling and the material culture recovered from the level indicates no particular specialization in utilization of the domesticates. Further assessment of the economic structure of this phase is not possible owing to the lack of information and comparative results. Examination of the faunal remains from the Early Bronze Age farm at Kilellan on Islay in the Inner Hebrides (Burgess, 1976a) reveals almost exactly the same situation as at the Udal. From this Burgess infers that there is

"no suggestion in the evidence uncovered so far that more than one group is represented, that the occupation was spread over a great length of time, or that it was intermittent or seasonal. These people were essentially pastoralists herding cattle and to a lesser extent sheep, having dogs and possibly pigs.....But the lack of fish remains, and of the bones of wild animals, suggests that food was no great problem and needed little supplementation from fishing or hunting."

Unfortunately, as previously explained there is a gap of some 900 years between the material recovered from the Early Bronze Age layers and that from the Pre-Wheelhouse contexts at the Udal. The latter deposits are almost certainly Bronze Age in date and can be seen to extend in the form of a large midden over a considerable area. A fairly clear picture of the economy of the various phases represented within that vast amount of material should be possible when it is fully excavated. At present there is some material available which is probably Late Bronze Age in origin but which will be referred to as pre-Wheelhouse until its exact characteristics are known. This pre-Wheelhouse deposit includes a funnel-shaped 'smithy' reminiscent of that found beside and pre-dating the wheelhouse at A'Cheardach Mhor. The faunal material from the pre-Wheelhouse levels comprises a minimum of 3 sheep and a lamb, 2 cattle and a pig, augmented by deer, seal and bird bones. There is insufficient evidence from which to draw any conclusions, other than that the relative proportions of the species indicate a pattern of farming in the tradition of the much earlier phases. When further excavation has penetrated more thoroughly into these deposits, a fuller assessment of the situation should be possible.

Iron Age settlement and economy.

In contrast to the preceding periods in the Outer Hebrides Iron

Age settlement is extensively represented. Wheelhouses are by far the best known structural forms from this period and at least a dozen have been 'excavated' to some degree over the past century. All of the available information has never been fully assembled and analysed but this situation will largely be rectified when the prehistoric levels at the Udal are published, since the stratigraphy and material culture of that site will be invaluable in the assessment of the inter-relationships of many sites which were excavated or analysed to a lower standard in the past. As mentioned in Chapter 1 the present author intends to synthesize and publish the assembled structural evidence for wheelhouses in the near future, and it is not proposed to deal with that aspect here, except in the most basic of terms. In addition to the wheelhouses, excavated evidence for Iron Age settlement in the Outer Hebrides presently consists of a few duns, a broch and possibly some temporary shelters, associated with Iron Age material. Among the large number of unexcavated sites known from the area are many duns (as discussed in Chapter 1), some souterrains, and some 'hut-circles'. These sites are undatable without excavation and may have been in use at a much later date.

As already mentioned in Chapter 1 there is a traditional, if unspecified, division of the wheelhouse class of structure into 'wheelhouses' and 'aisled roundhouses' according to the arrangement of construction of the radial piers. The present author feels that this distinction is inappropriate since the majority of the known 'wheelhouses' also have free-standing stone piers, whether or not the 'aisle' was eventually blocked up. Therefore a new distinction is

proposed, retaining the original groups but divided in terms of location and context, rather than on purely structural terms. The 'wheelhouses' are located in machair areas and lie conveniently between the sea and the higher ground (eg. A'Cheardach Mhor). They are constructed with a single skin of walling which appears to act as a revetment to hold back the sand or midden into which the structures are generally set. Internally the area is divided into bays by the use of stone piers radiating out around a central area. There are generally no traces of outbuildings or enclosures associated with these 'wheelhouses' although many of them may have an integral souterrain which may have functioned as a store-room. They regularly occur in pairs and such investigation as has taken place suggests that these are successive, with the earlier probably being re-used during occupation of the later (as at the Udal), possibly as outbuildings. In contrast 'aisled roundhouses' are located on higher, rocky ground inland from the machair areas and are constructed of massive stonework, comprising inner and outer stone faces with a rubble core. These structures are surrounded by outbuildings and set within an enclosure but they largely resemble 'wheelhouses' in internal features.

Many of the wheelhouse group of structures have been excavated to date but there is faunal evidence extant from very few. The Udal excavations are establishing the exact sequence of use and disuse of the two wheelhouses there, and their proven association with a field system indicates that much evidence may have been missed at other sites. From the earlier wheelhouse at the Udal were recovered bones

of at least 9 sheep and a lamb, 5 cattle and 2 calves, 5 pigs and a piglet and a medium-sized dog and a puppy. This evidence suggests an increased interest in cattle and pig in comparison with the earlier periods at the site and the trend is continued into the later wheelhouse/squatter levels where at least 3 sheep, 3 lambs and 3 possibly foetal lambs, 6 cattle, 3 calves and a possibly foetal calf, 5 pigs, a piglet and a possibly foetal piglet, represent the domestic stock recovered, along with a small dog. Sheep still appear to be maintained as a small flock for generalized usage but the cattle evidence suggests that the animals were killed at a later age than previously, probably indicating a greater degree of prosperity for the inhabitants of the site (since they could afford to over-winter the beasts) and perhaps a greater interest in beef production. Crawford (pers.comm.) points out that in the Historic period pigs were commonly kept on machair islands and are present in reasonable quantity in tacksmen's wills. Their increased abundance in the wheelhouse and squatter periods at the Udal is no doubt due to their economic value in meat and other commodities, in relation to their omniverous habits.

From the wheelhouses at Sollas came a very large number of animals - mainly recovered from the pit 'burials' in Wheelhouse B. From the earlier Wheelhouse A and the associated midden were identified the remains of at least 22 sheep and 2 lambs, 8 cattle and 4 calves and 2 pigs. However, the complete skeletons found in Wheelhouse B were 47 sheep and 7 possibly foetal lambs, 23 cattle and 5 calves, 2 pigs and 4 piglets. These quantities are far in excess of the numbers derived from any other site and two factors are considered

relevant. In the first place, the recovery of complete skeletons gives an actual number of animals represented as opposed to a population estimate based on fragments which can only suggest the minimum number of individuals which might be represented and which is known to underestimate greatly the number of animals originally present. In this instance, however, the situation is complicated by the fact that the complete burials do not appear to be purely 'domestic' refuse, although they are associated with domestic debris. The possibility therefore remains that the animals found in the pits may not represent the stock from any one site but might have been brought there from other areas for a specific purpose.

The sample of bone from the wheelhouse at A'Cheardach Mhor is small and the original assemblage is not now complete. Sheep, cattle, pig and dogs (large and small) are represented but it is not possible to gauge the quantities of the species involved. The same situation exists for the two wheelhouses at A'Cheardach Bheag.

Red Deer does not seem to have been particularly important to any of the Iron Age groups discussed above, since it is represented by only a few bones and teeth at each site. This is in strong contrast to the situation at Northton where the earlier Iron Age/Historic layer produced a large quantity of deer remains: this is presumed to be due to greater availability of deer in the wooded landscape of Harris. Bird and fish appear to have varied in importance to the wheelhouse inhabitants too although, as has been suggested above in relation to earlier periods, the lack of sieving at most sites may have influenced

this situation to a great extent. Shellfishing remained important at all sites, whether for bait or food.

That the inhabitants of the wheelhouses were practising a mixed farming economy seems in little doubt: the faunal remains point to a pastoral regime of sheep and cattle with a few pigs and with a dog to aid in the animal management. The presence of wheelhouse fields at the Udal suggests that cultivation of the machair was practised. The recovery of saddle and rotary querns from the sites supports this, although little evidence for ploughshares and other agricultural implements has been recovered. Spindle-whorls indicate the spinning of wool and other items of worked bone have been suggested as implements for textile production. Bronze and/or iron working was practised at almost all of the sites.

Evidence for the economy of the 'aisled roundhouses' is not available, partly due to the fact that fewer are known and partly because the general location of such sites on peaty uplands means that the bone is largely destroyed by the acid soil. Thus the only site for which there is any faunal information is Tigh Talamhanta at the Allasdale in Barra where sheep and cattle were the only species found. However, the structural remains from this site (Young, 1952-3) supply economic evidence of a different type. The complex consists of the aisled roundhouse with an integral souterrain, a 'kiln-house', an outside working area and a barn/byre, the whole contained within a walled enclosure of 1.5 acres. Outside the entrance to the house structure itself were the remains of a working platform suggested as a

dairy due to pottery bowl forms found there. The 'kiln-house' was believed by Scott (the original excavator) to have been used for corn-drying but no reasoning is given to support this suggestion. A small working area with a central drain running through it was built against the rock outcrop and was presumably used for food processing or some creative activity although there is no evidence for the nature of its use. The most interesting feature of the site is the steading which comprises a 'byre' area with a lined and covered drain and a clay-built hearth, and a 'barn' area with a square paved hearth and a gravel floor. The enclosing wall formed one side of this steading which appeared to be of 'lean-to' construction.

The other aisled roundhouse which has been excavated, that at Clettraval, North Uist (Scott, 1948) shows structural evidence for a similar economic community to that at Tigh Talamhanta but here no bone material survived. The site complex again consists of the house itself with a working platform outside, two small oval buildings beside the entrance, three more some distance away, and a 'byre' building, the whole area being enclosed by a turf and stone wall. The site can be seen as comprising farmhouse, byre, storage building, animal pens or stable, processing areas and even a farm pond, all within the farmyard boundary. A piece of red oxide is suggested as being a pigment, conceivably for textile production, and bronze-casting was carried out at the site, unlike Tigh Talamhanta where iron-smelting is evidenced. Bone, iron and wood did not survive in the acid soil so there are no implements extant from the site and only a pumice spindle whorl adds to the economic evidence available.

The evidence from both of the excavated aisled roundhouses suggests a mixed economy as the structural remains appear to provide for the maintenance of animals and the storage and processing of crops within the farmyard area.

Only two duns have ever been excavated in the Outer Hebrides: Dun Cuier in Barra and Dun Thomaidh on Vallay in North Uist. Dun Cuier lies in an upland area a mile from the aisled roundhouse of Tigh Talamhanta and excavation revealed evidence of shorthorn cattle, Soay-type sheep, pig and pony as domesticated animals with the exploitation of Grey Seal, otter, birds, fish and shellfish. Whale bone and antler were utilized for tools and rotary querns indicate cultivation but the main evidence for economic practice at the site is in the form of much iron slag which shows considerable metal-working in progress. Dating evidence suggests that the occupation of Dun Cuier may be later than that of the aisled farmhouses and wheelhouses since pottery from the site shows close affinities to that from the later phase at Clettraval. There is almost no economic evidence extant from Dun Thomaidh, not least because among the "numerous kitchen-midden remains" were "bones showing only cut marks" (Beveridge and Callander, 1930-1, p.323) which were not judged worth preserving. The site lies on a small rocky islet connected to the island of Vallay by a causeway and quern stones are included among the remaining artefacts so it is likely that domestic occupation also took place there.

Dun Carloway in Lewis is the only broch to have been dug in the Outer Hebrides to date and excavation was limited to one intra-mural chamber which produced no evidence of domestic occupation (Tabraham, 1976-7). Hence brochs will not be further discussed here.

The only remaining evidence for Iron Age occupation in the Outer Hebrides is at Unival, North Uist and consists of two 'rooms' of sub-rectangular form joined by a small passage. This is of slight construction and has very little cultural material associated with it. Only a few sherds, some cattle bones and some shellfish were found although the arrangement of the 'store-room' suggested to the excavator that agriculture was practised (Scott, 1947-8). Whether or not the site was the residence of a herdsman (as the excavator postulated) there is insufficient evidence to draw any conclusions as to the economy. Later Iron Age pottery seems to be associated with casual use of the site and shows similarities to material from wheelhouses and aisled roundhouses. Scott (ibid.) suggests this to be evidence of temporary shielings occupied for summer pasturing of the flocks and herds of the inhabitants of the machair-based wheelhouses.

It is apparent from examination of the evidence from Iron Age sites in the Outer Hebrides that a similar economic structure is in operation throughout. The faunal remains from the machair-based wheelhouses could creditably have been recovered from the farmyards of the aisled wheelhouses and it is suggested that the forms of evidence are complementary and are due to differential survival of structures

and material. The difference in building forms appears to be related to location rather than to differing economy. Both wheelhouses and aisled roundhouses apparently enjoyed a mixed farming tradition, herding sheep and cattle, sometimes keeping pigs, ponies and dogs, and cultivating grain. Wild resources of deer and small animals were taken where available and fishing, fowling and shell collecting were universal. Perhaps a difference in farming practice, if not in economic basis, can be suggested by the wheelhouse inhabitants bringing their animals down to over-winter on the machair, while the aisled-roundhouse farmers maintained their animals within the shelter of the farmyard premises. Thus there would be no need for byres etc. at the machair sites where the animals could be contained outside near the dwelling all winter. The suggestion of a summer shieling for a herdsman on the upland at this period is particularly interesting but cannot at present be substantiated. Evidence from duns is insufficient for comparison except to note that cultivation and animal husbandry were apparently known, but the main occupation may have been of an industrial nature.

Summary.

Using all the available evidence for settlement and economy in the Outer Hebrides in prehistory it is possible to outline the development of farming in the area. In the Neolithic period small (family) groups of pastoralists were settled in coastal situations where they kept a few sheep and cattle and sometimes a dog. Other

food and raw materials were obtained from wild resources but the main emphasis was on the domesticated stock. Cultivation was not practised but occupation was apparently on a permanent basis and stone-working, potting and bone-working were carried out. By the Beaker period, a dichotomy is evident in the economic practices of the Outer Hebrides although settlement is still coastal in distribution. While in North Uist a mixed farming economy was still based on sheep and cattle but now augmented by the cultivation of barley and oats, in Harris the hunting/gathering element was more pronounced and, while sheep and cattle were still the staple diet, wild resources accounted for much of the food supply. Cultivation was not yet known and the introduction of a pony to the site at this time was presumably for riding. The scanty evidence for the Early Bronze Age points to the permanent settlement of a small unit in the same coastal situation as previously in North Uist and the practice of a similar mixed farming economy supplemented by fishing and fowling. At this point the continuous pattern of settlement in the Outer Hebrides is brought to an abrupt halt by the lack of excavated material from the Middle and Later Bronze Age, a situation which will only be rectified by the location and excavation of suitable sites in the area. The pattern of settlement and economy up to this point shows a gradual progression from pastoralism (with hunting/gathering) to a mixed economy, based throughout on the apparently permanent settlement of family groups. Different groups were evidently open to varying degrees of influence as can be seen from the situation in the Beaker period.

The evidence for Iron Age settlement and economy is on a totally

different scale to anything earlier but the same pattern is represented. Small groups are settled on a permanent basis in individual dwellings, implementing a mixed farming economy and indulging in textile and tool production and extensive metalworking, with a system of trade and exchange reaching to the mainland and beyond. This pattern seems standard for both machair and upland sites and the variation in building technique represents a response to differing environmental conditions, rather than the economic situation. The suggestion that from the Neolithic onwards the flocks and herds may have been taken to summer pasture on the uplands and returned to the machair for the winter months may be supported by evidence for possible shielings on the upland in the Iron Age but the pattern is broken by the aisled wheelhouse sites where settlement apparently continued on the hill throughout the year. The limited evidence for duns suggests that this structural form may have had a specific industrial function in this period and that domestic occupation was incidental to production.

Based on the limited evidence available, the situation in the Outer Hebrides in prehistory is one of stable groups slowly evolving a system of mixed farming and settlement in keeping with their environment. There are no signs of a poor economy at any stage and the lack of indications of any specialized farming practice is to be expected. As one faunal analyst expressed it:

"Only a sophisticated and rich urban market induces agricultural produce of difficult and expensive crops and livestock." (Noddle, 1978, p.309)

The situation in the Outer Hebrides throughout prehistory is one of small-scale farming communities exploiting their environment to the full.

Prospect.

In this thesis I have attempted to draw together all the evidence to produce a detailed description of prehistoric economy and settlement in the Outer Hebrides. A distinct pattern has been detected through this work and future excavation and analysis will no doubt modify or clarify the conclusions reached here. That is justification enough for the present study if it stimulates further examination of the sites and material culture of the area. However, in the progress of this study several important aspects have been found to be totally lacking and I would like to conclude by suggesting ways in which the situation could be rectified.

As has been noted there is an imbalance in the knowledge of prehistoric domestic sites in the Outer Hebrides and evidence is badly required for the Bronze Age in particular. The information from the Udal suggests that these sites may be situated in the same coastal areas as settlement from the preceding periods and certainly Beaker and Bronze Age material is known to be eroding out of sites down the west coast of the Uists. Since the likelihood of the discovery of another complex of the stratigraphic depth and importance of the Udal is slim,

perhaps excavation of a few of these erosion sites might add something at least to the present corpus of data. Island duns, which are so plentiful in the area, offer the potential of water-logged deposits of organic material in addition to the importance of their dating for the overall picture of prehistoric settlement. Brochs too are in need of investigation if more is to be added to the limited information from Dun Carloway. The suggestion of Mesolithic material from Berie, Lewis (RCAMS, NGR NB102356) also warrents further examination.

Field survey of the islands would also be invaluable in re-assessing the location and distribution of sites, particularly with regard to the upland areas, since research is normally restricted to the structurally obvious sites on the machair. In this way a more realistic distribution of sites might be seen, for example in additions to the current sample of three 'aisled roundhouses' on the uplands. Overall there is need of a research strategy of some extent to concentrate on recognizing the full extent of settlement archaeology in the area.

The methods of faunal analysis currently employed have been found to be largely unhelpful in dealing with the prehistoric assemblages from the Outer Hebrides. There is a need for an extensive programme of research to establish ageing and sexing data for species comparable to those represented by archaeological remains under the distinctive nutritional conditions of the islands. This should include particularly the study of tooth eruption and wear, epiphyseal fusion

and horn-core development for sheep and cattle, ageing criteria for fish and indications of seasonality for mammals, fish and shellfish. In the light of such information a much fuller picture of prehistoric settlement and economy in the Outer Hebrides could have been drawn in this thesis.

BIBLIOGRAPHY

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Abbreviations.

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<u>BAR</u>	British Archaeological Reports
<u>DES</u>	Discovery and Excavation in Scotland
<u>GAJ</u>	Glasgow Archaeological Journal
<u>Jnl.Arch.Sci.</u>	Journal of Archaeological Science
<u>Jnl.Brit.Grass.Soc.</u>	Journal of the British Grassland Society
<u>Jnl.Ecology</u>	Journal of Ecology
<u>PPS</u>	Proceedings of the Prehistoric Society
<u>Proc.Roy.Soc.Edinburgh</u>	Proceedings of the Royal Society of Edinburgh
<u>PSAS</u>	Proceedings of the Society of Antiquaries of Scotland
<u>RCAMS</u>	Royal Commission on the Ancient and Historic Monuments of Scotland
<u>Scot.Arch.Forum</u>	Scottish Archaeological Forum
<u>Scot.Geog.Mag.</u>	Scottish Geographical Magazine
<u>Trans.Bot.Soc.Edin.</u>	Transactions of the Botanical Society of Edinburgh
<u>Trans.Inst.Brit.Geog.</u>	Transactions of the Institute of British Geographers

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FIGURES 1-20.

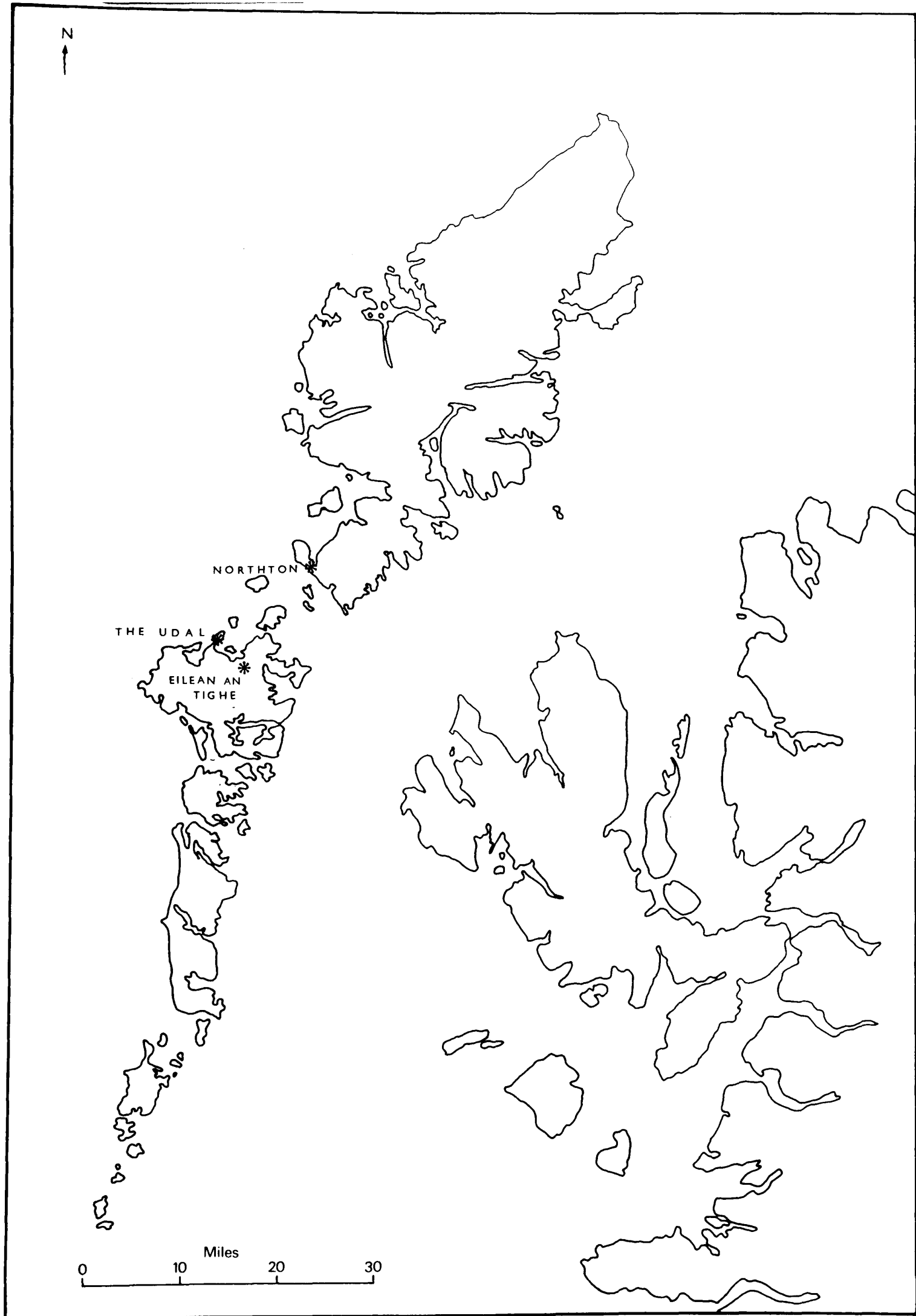


Fig. 1 Neolithic settlements in the Outer Hebrides.

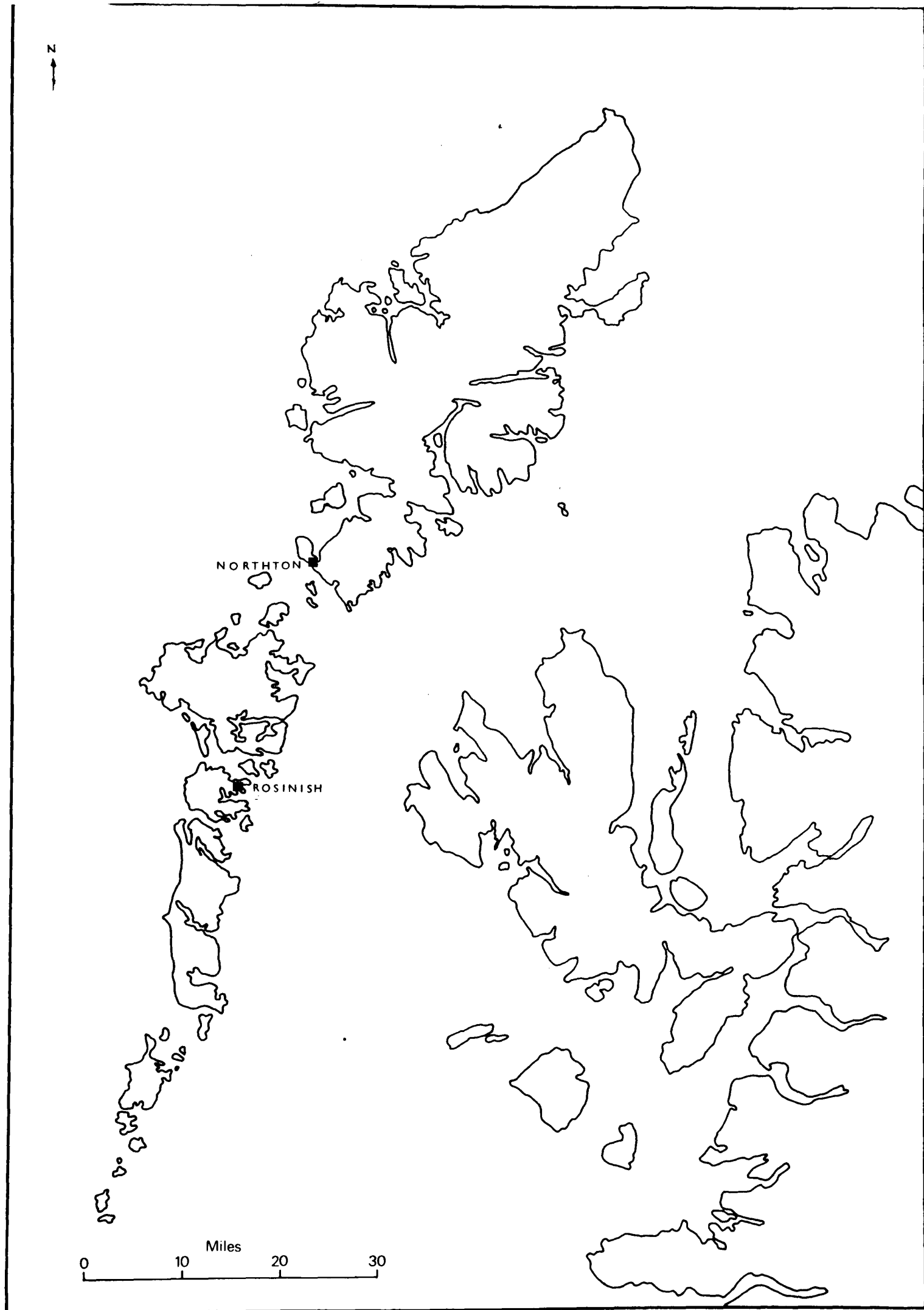


Fig. 2 Beaker settlement in the Outer Hebrides.

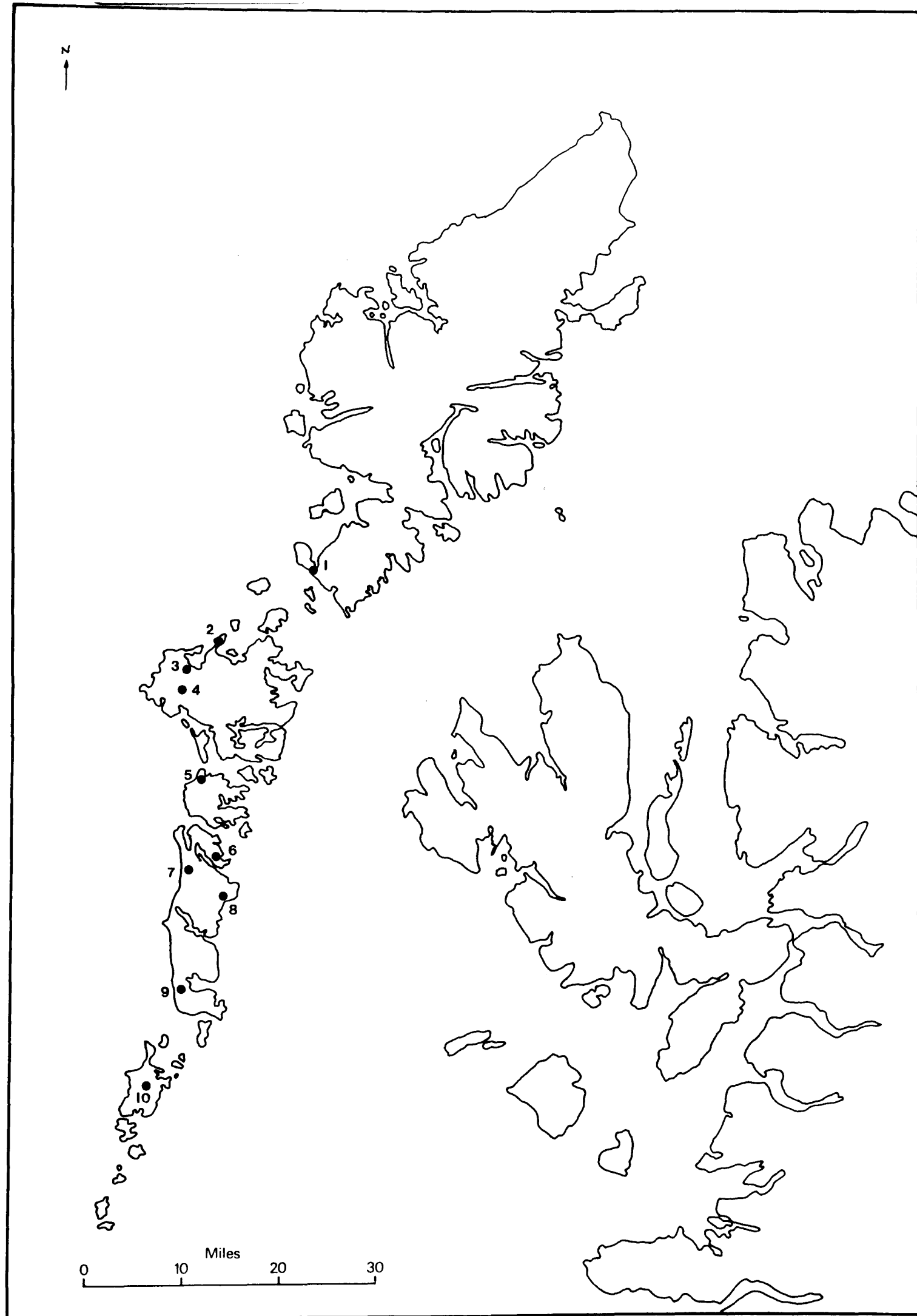


Fig. 3 Iron Age settlements in the Outer Hebrides, mentioned in the text (see over for key).

1. Northton, Harris (Simpson 1976)
2. The Udal, North Uist (Crawford 1967-83, Beveridge 1911, RCAMS 1928 No.273)
3. Sollas, North Uist (Atkinson pers.comm., Beveridge 1911, RCAMS 1928 No.272)
4. Cnoc'a Comdhalach, North Uist (Beveridge 1911, RCAMS 1928 No.269)
5. Garry Iochdrach, North Uist (Beveridge + Callender 1934)
6. Clettraval, North Uist (Scott 1949)
7. Bruach Ban/Bruach a Tuath, Benbecula (Scott + Scott 1956)
8. Calternish, South Uist (RCAMS 1928 No.393)
9. A'Cheardach Mhor, South Uist (Young + Richardson 1959-60)
10. A'Cheardach Bheag, South Uist (Fairhurst 1971)
11. Usinish, South Uist (Thomas 1875, RCAMS 1928 No.395 +396)
12. Kilpheder, South Uist (Lethbridge 1952)
13. Tigh Talamhanta, Barra (Young 1952-53)

Key to Fig. 3 - Iron Age settlements in the Outer Hebrides,
mentioned in the text.

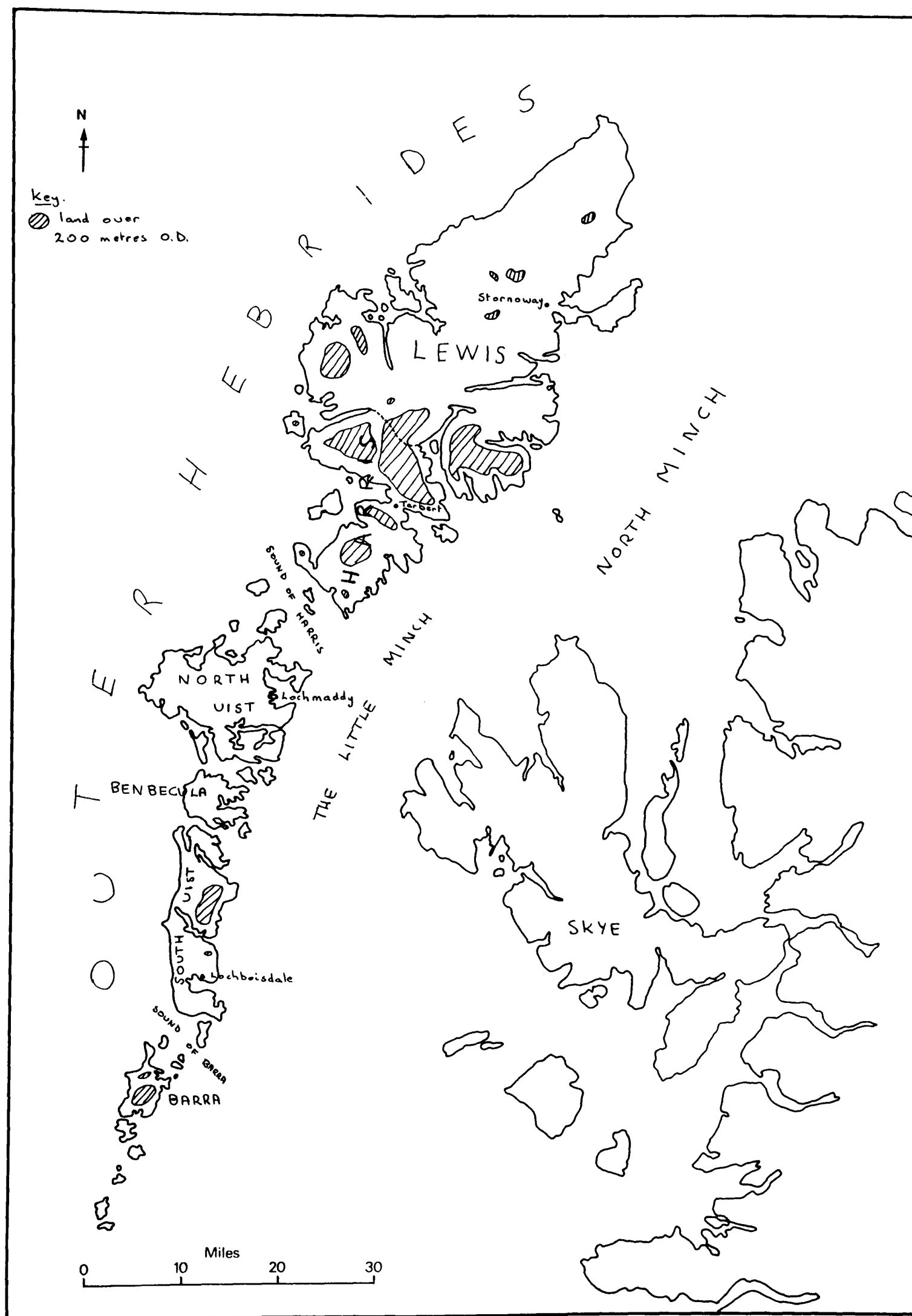


Fig. 4 The Outer Hebrides.

Fig.5. Neolithic - Sheep First Phalanges; GLpe:Bp

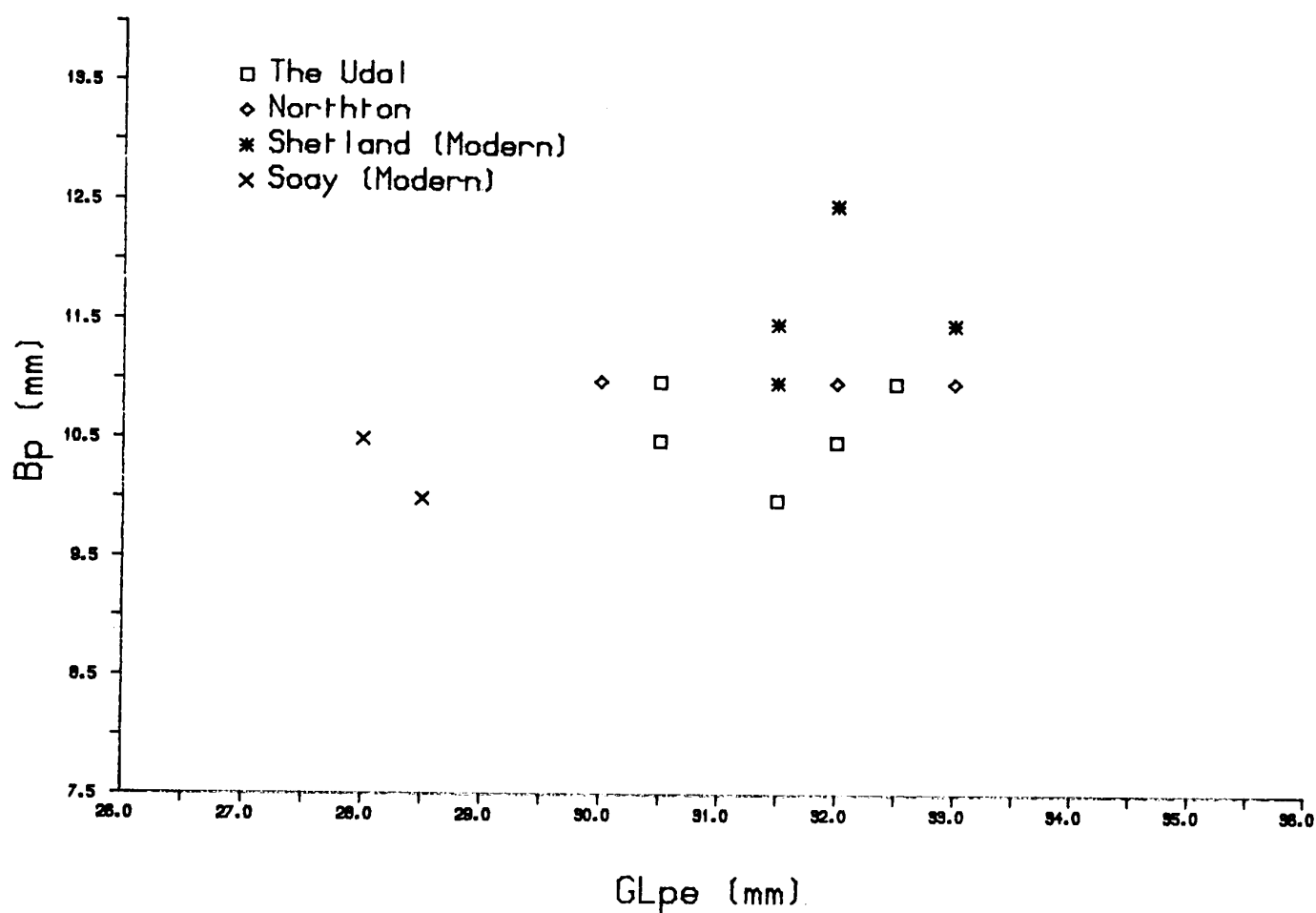


Fig.6. Neolithic Sheep Second Phalanges; GL:Bp

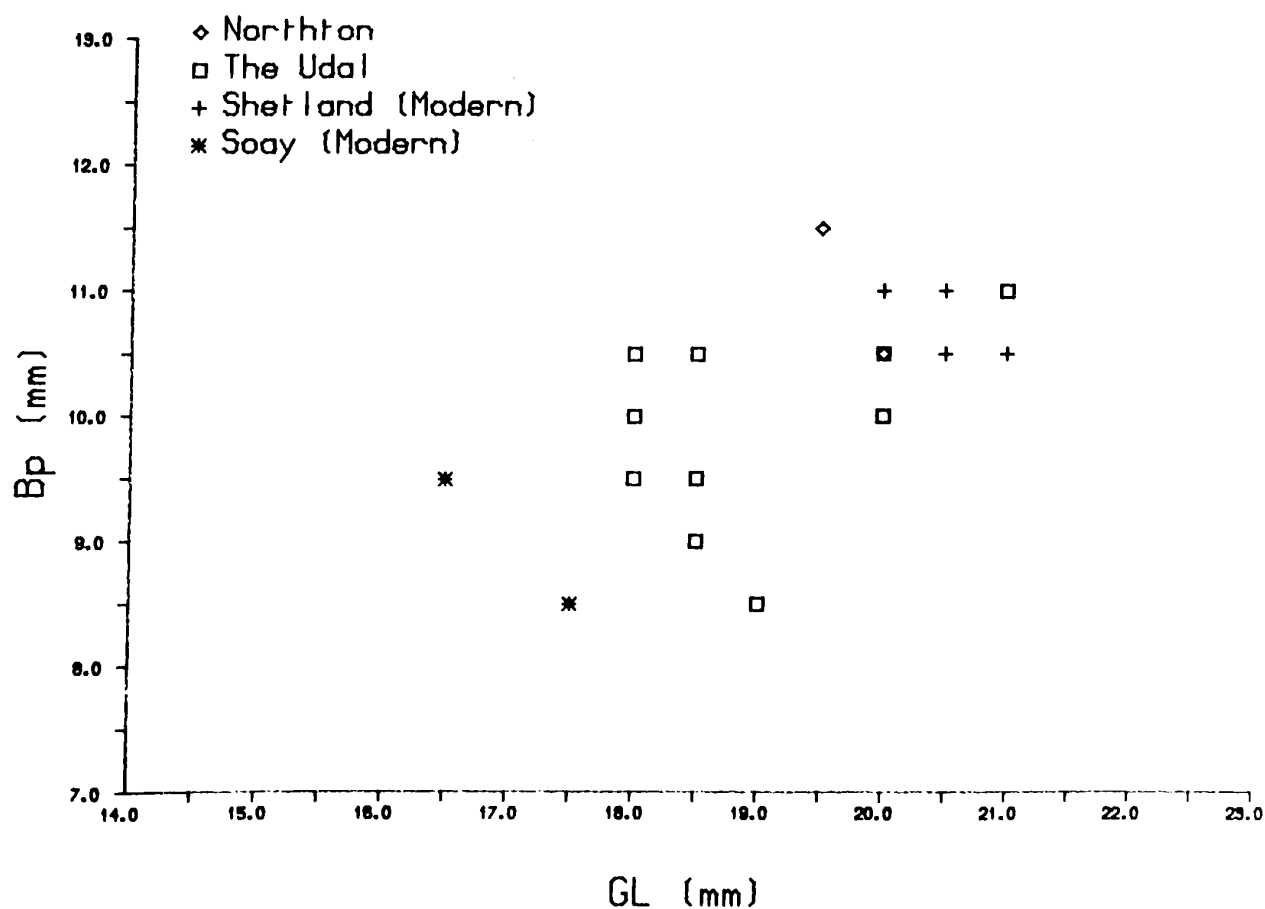


Fig.7. Iron Age - Sheep First Phalanges; GLpe:Bp

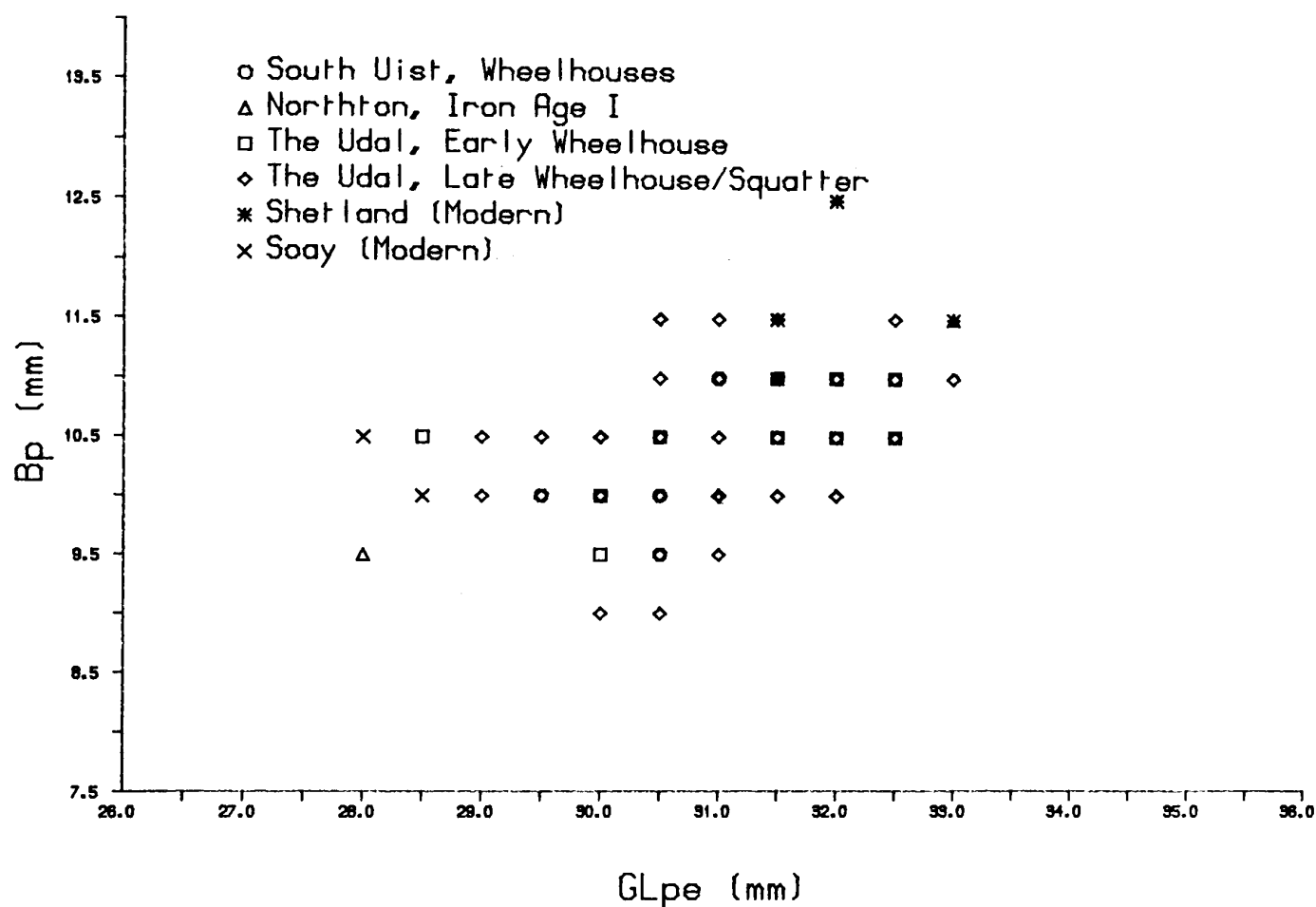


Fig.8. Iron Age - Sheep Metacarpals; GL:Bd

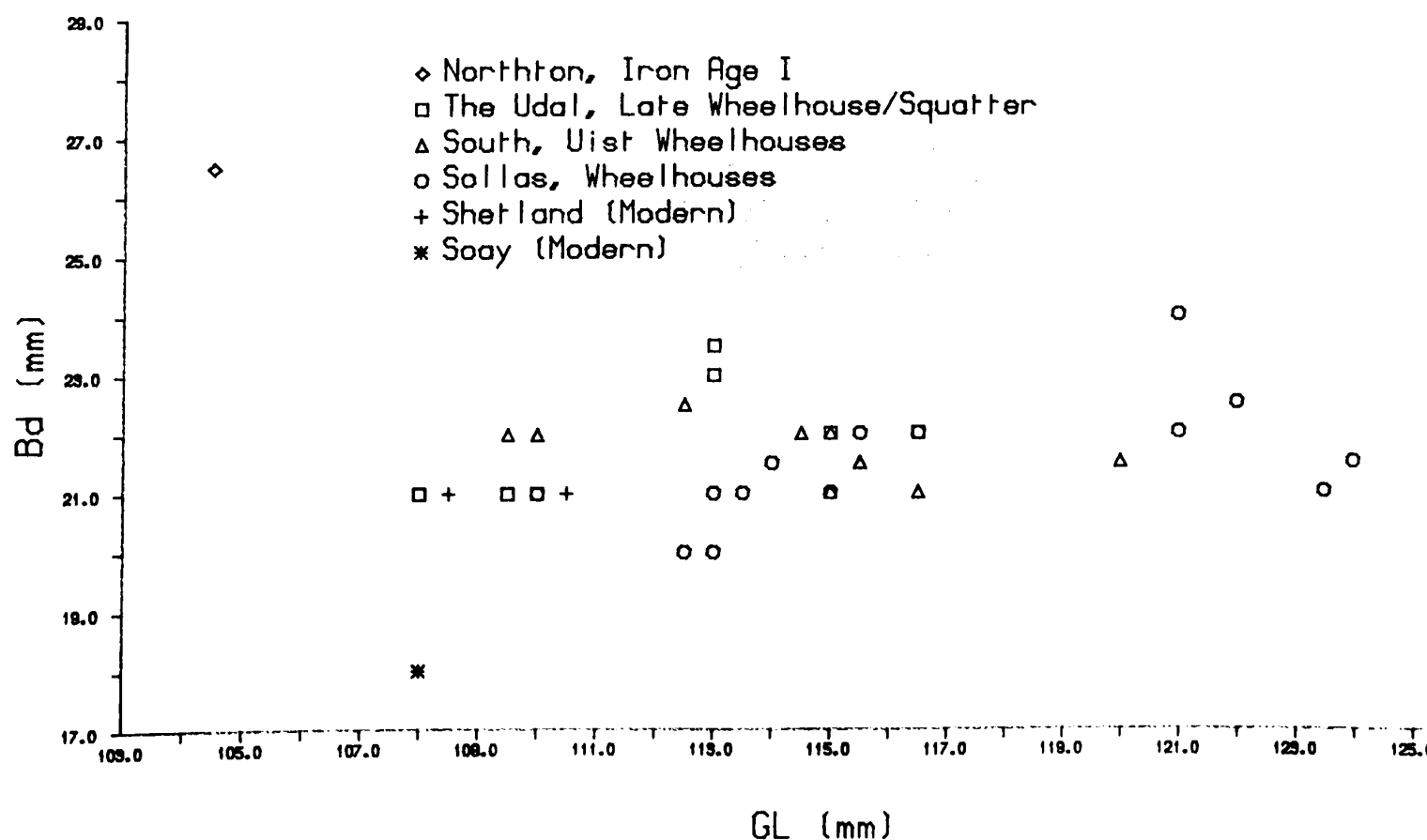


Fig.9. The Udal - Sheep First Phalanges; GLpe:Bp

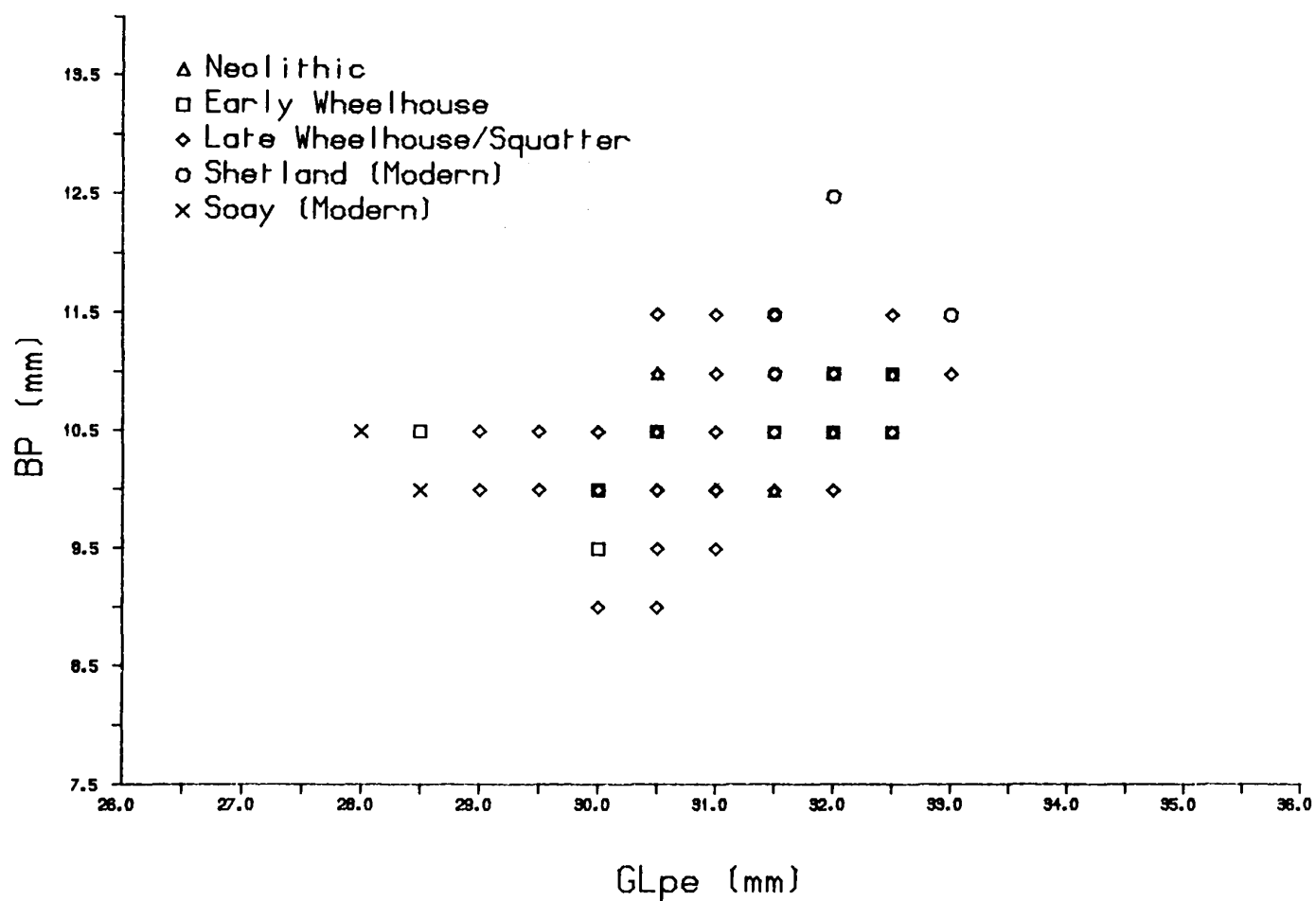


Fig.10. The Udal - Sheep Second Phalanges; GL:Bp

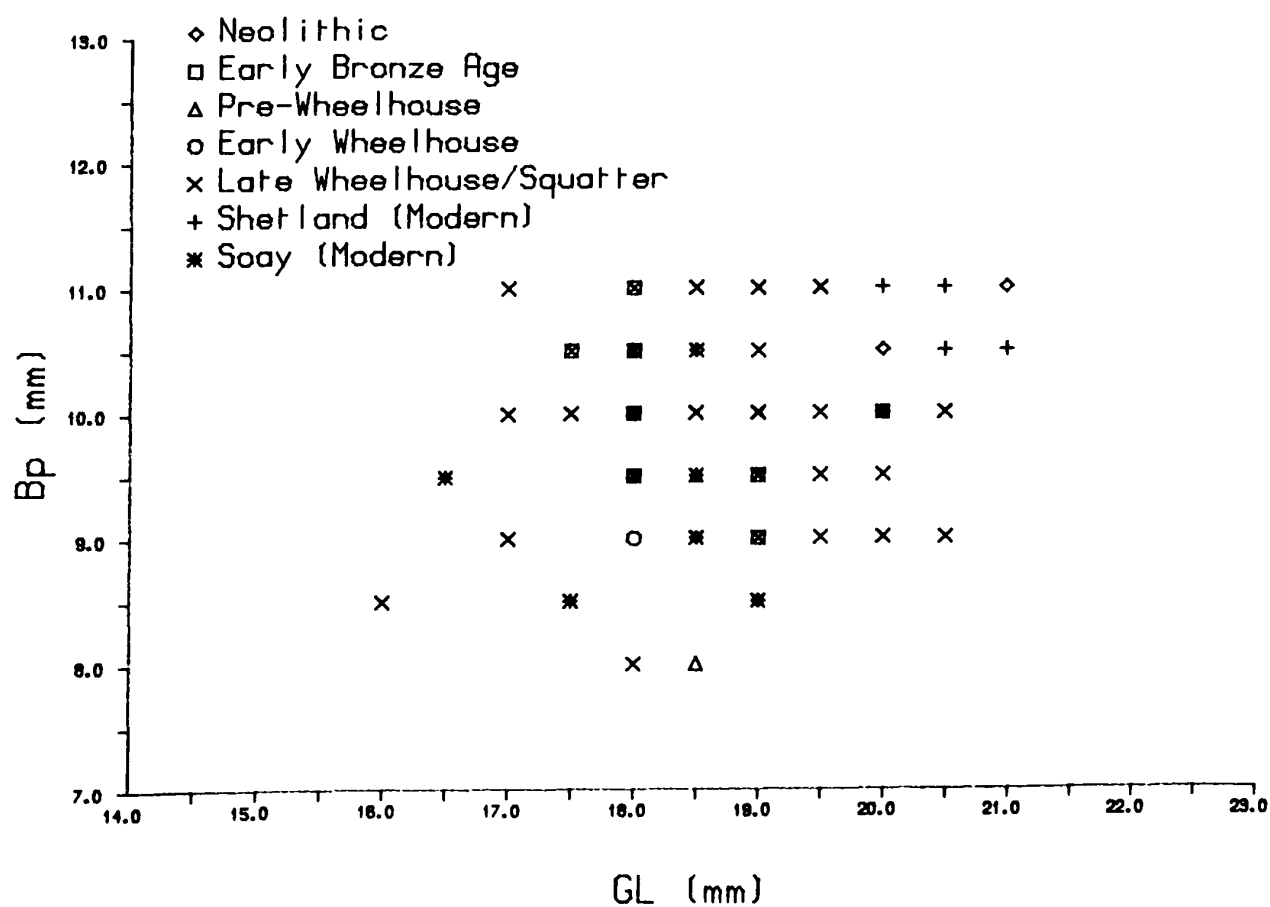


Fig.11. Cattle First Phalanges; GLpe:Bp

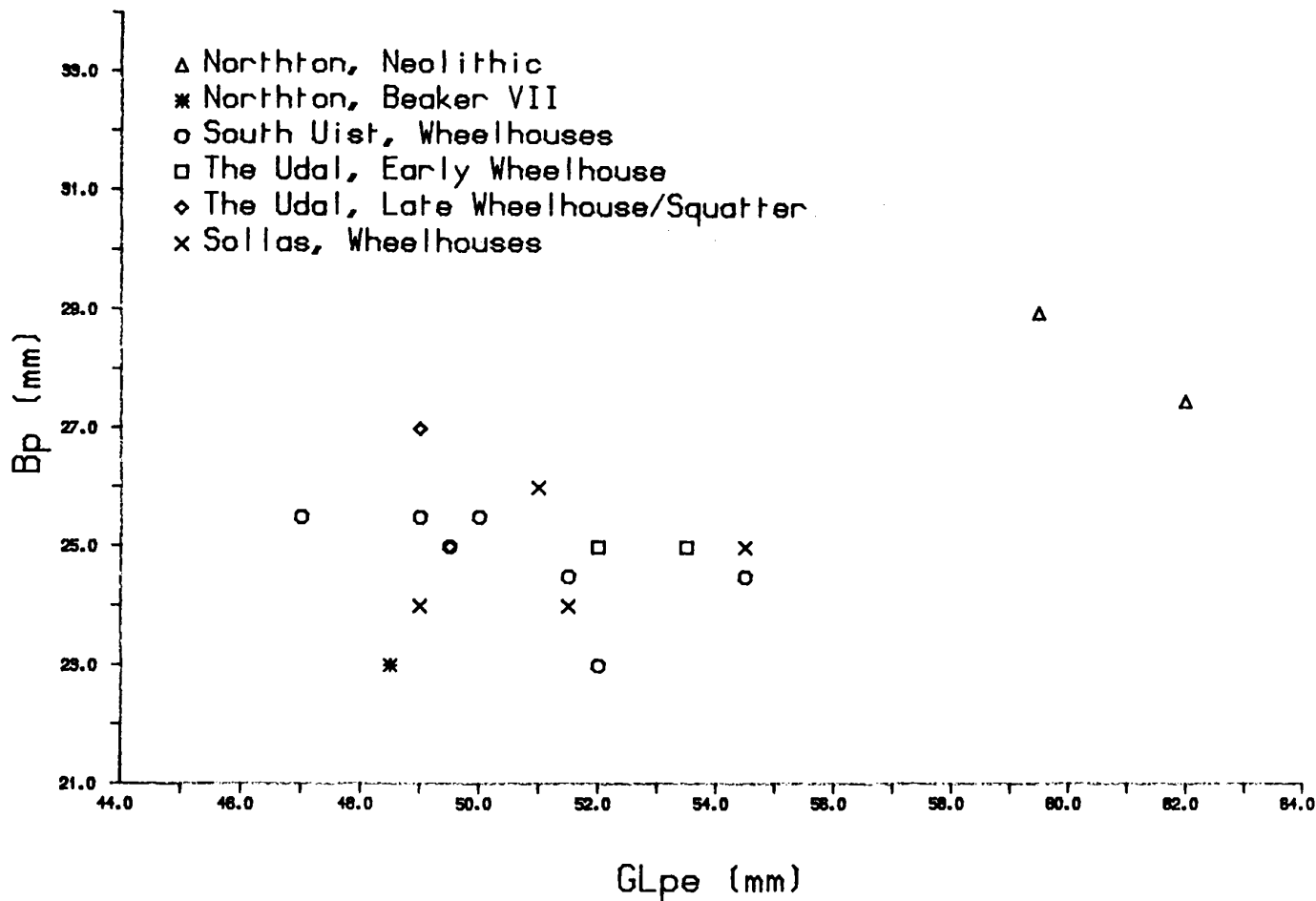


Fig.12. Cattle Second Phalanges; GL:Bp

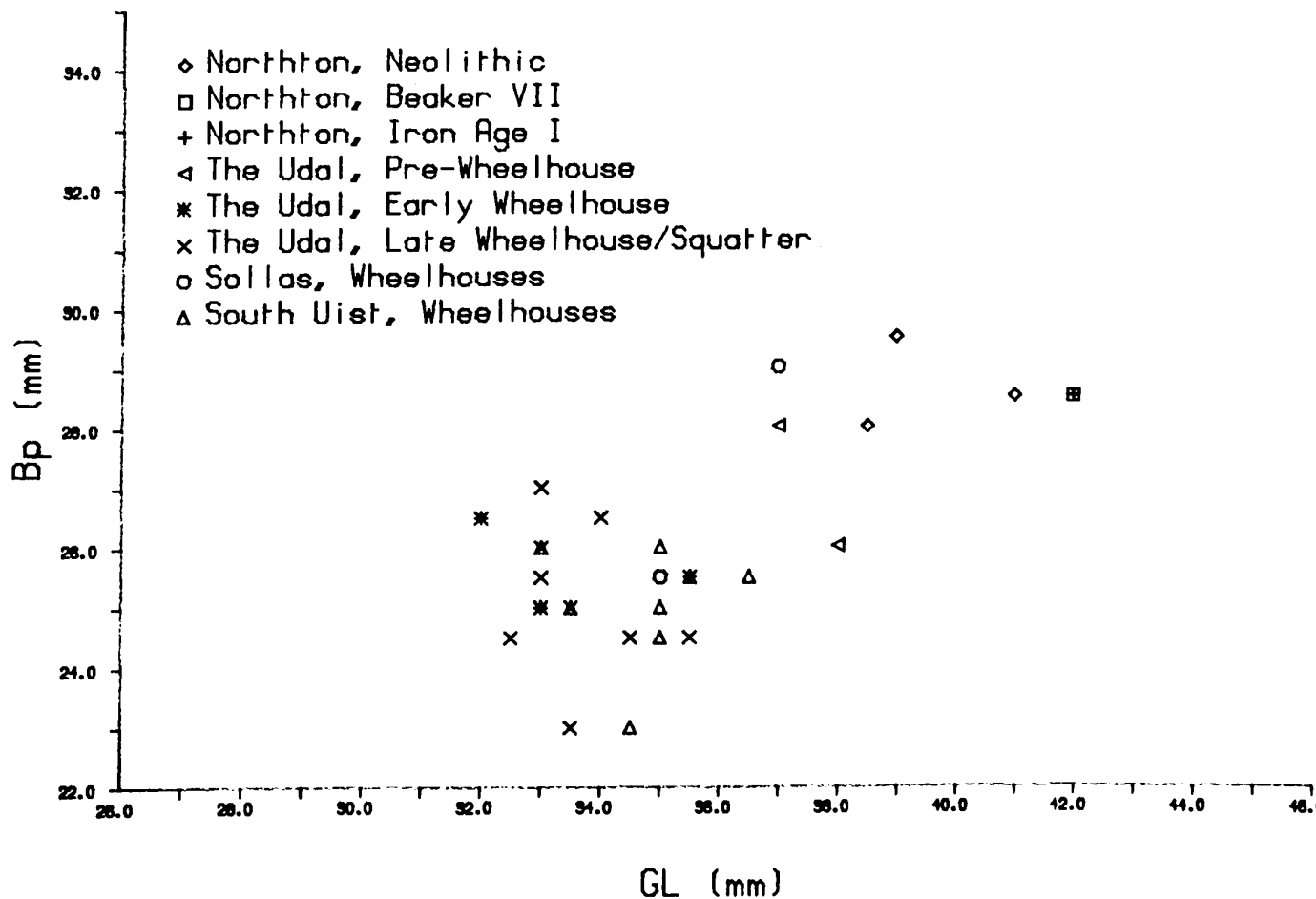
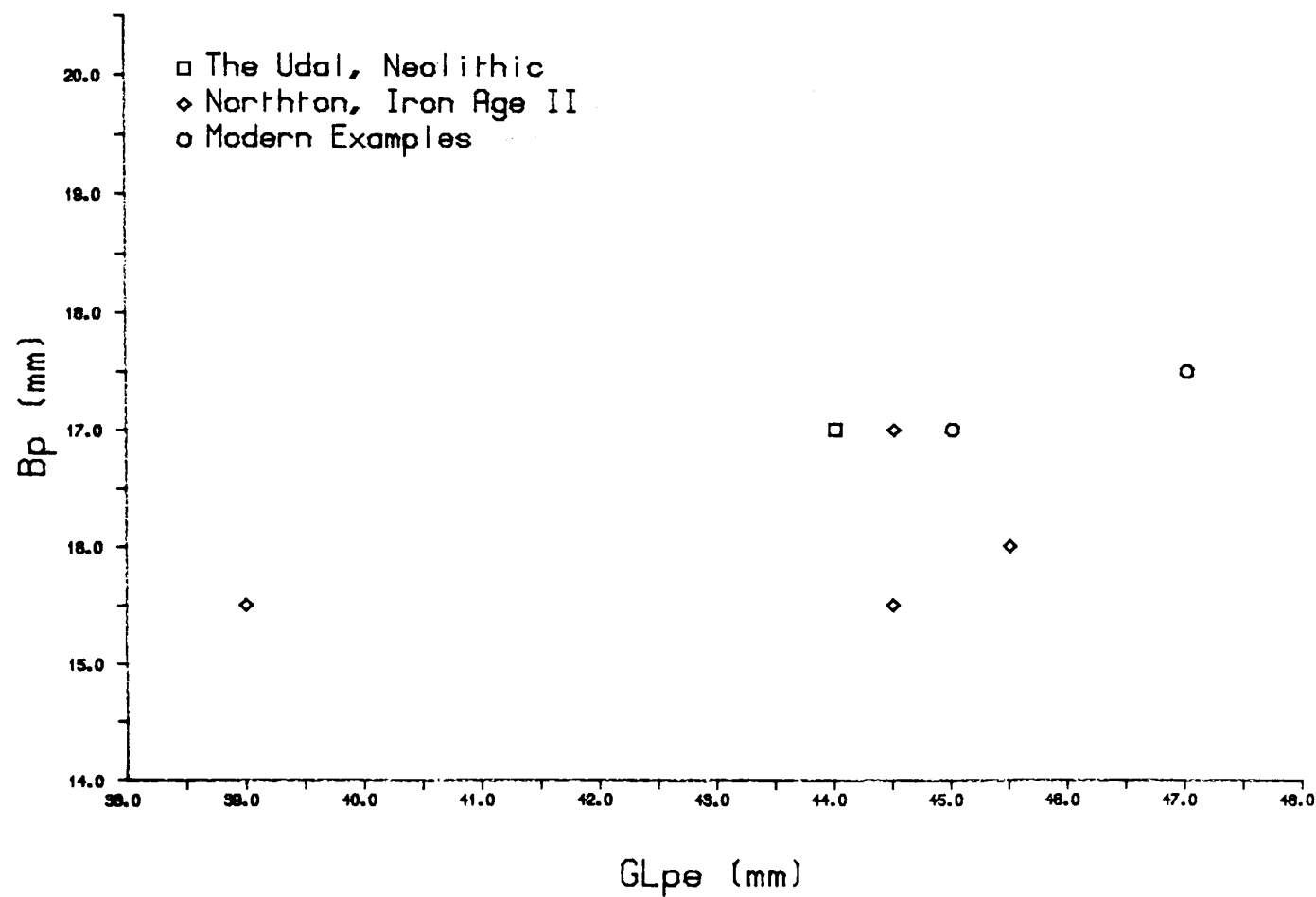
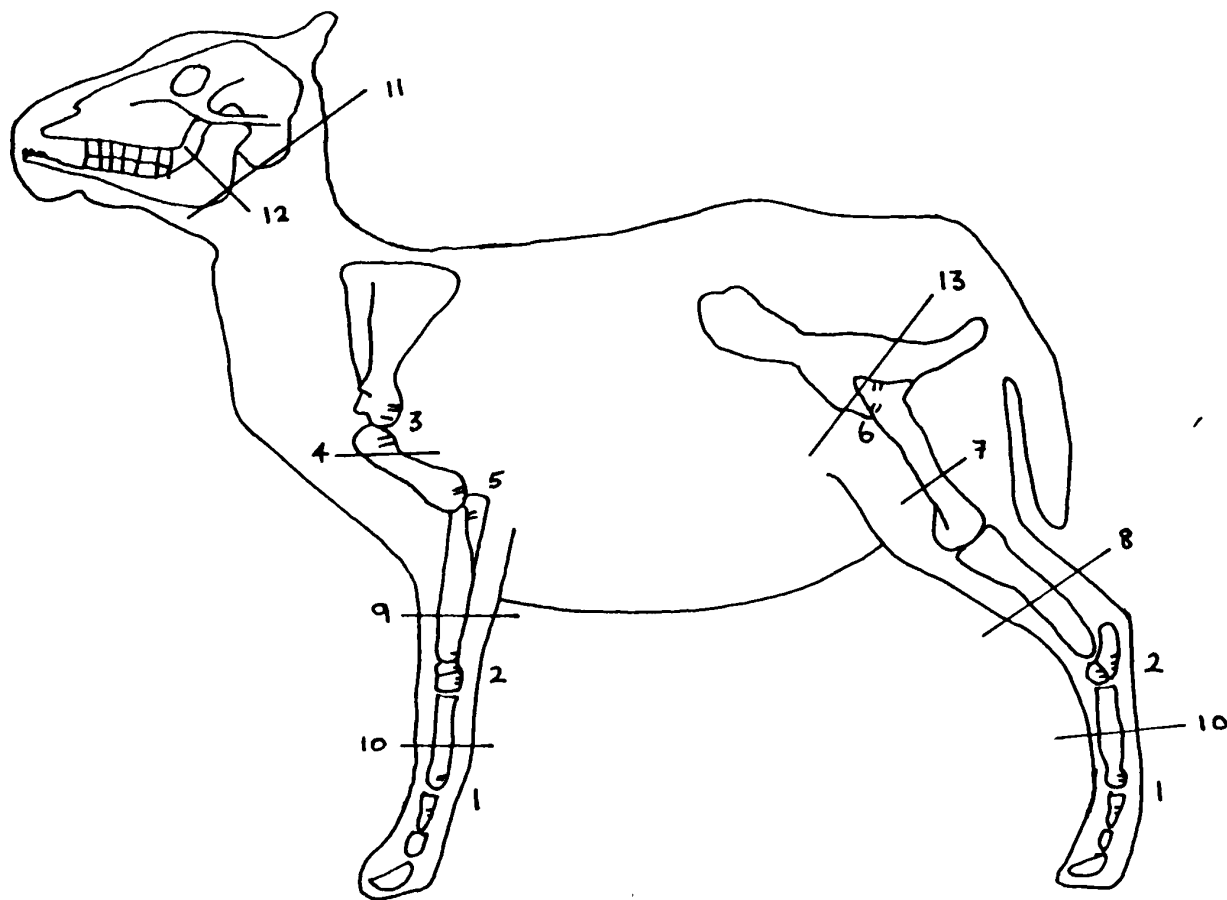




Fig.13. Red Deer First Phalanges; GLpe:Bp



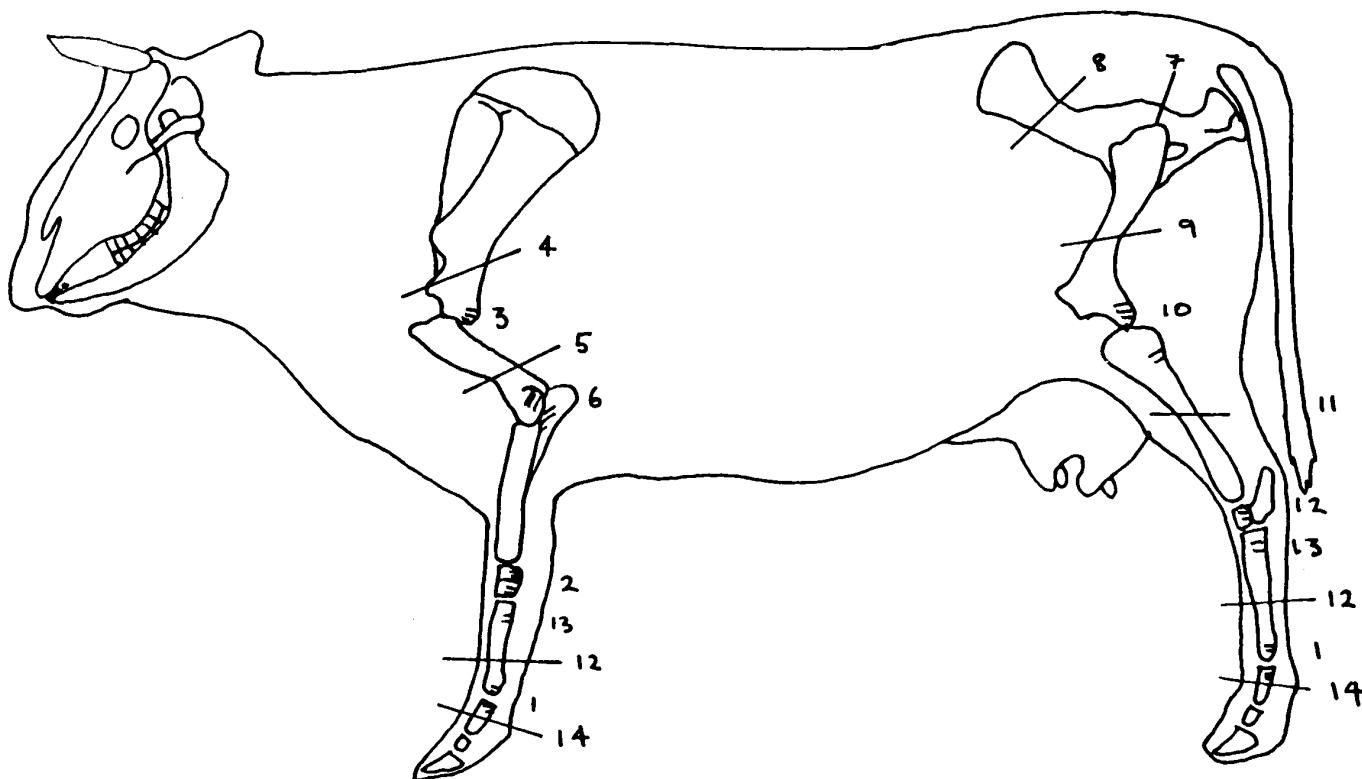


KEY.

-  'chopping' marks
 'stripping' marks

Numbers refer to specific butchery marks and their significance is explained in the text.

Figure 14. Diagrammatic skeleton indicating butchery marks represented on sheep bone from Sollas.



KEY.



'chopping' marks



'stripping' marks

Numbers refer to specific butchery marks and their significance is explained in the text.

Figure 15. Diagrammatic skeleton indicating butchery marks represented on cattle bone from Sollas.

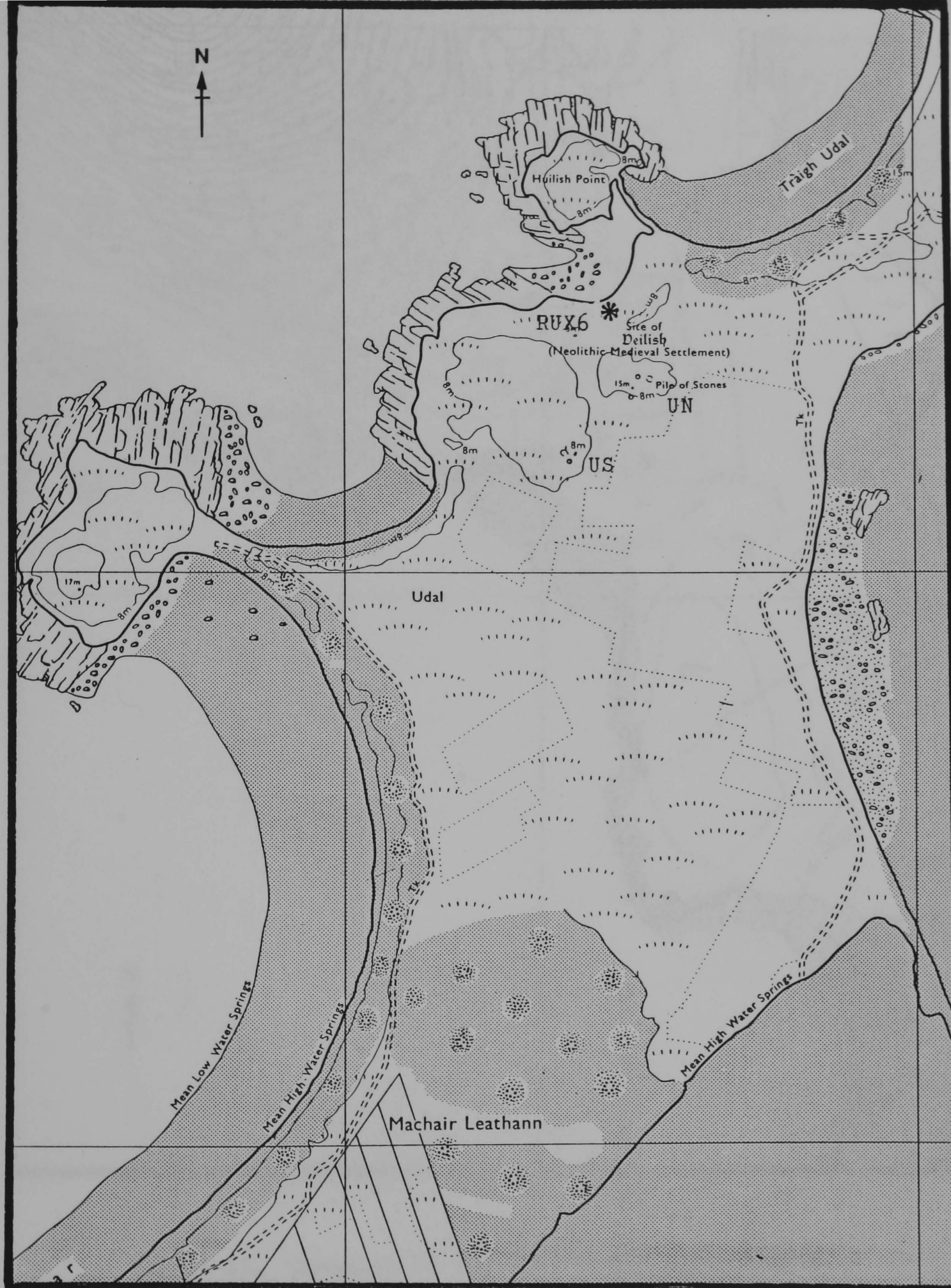


Figure 16. Location of the sites at the Udal, North Uist.

RUX6 - Neolithic, Beaker and Bronze Age

US - Pre-Wheelhouse and Wheelhouse

UN - Wheelhouse fields and later occupation

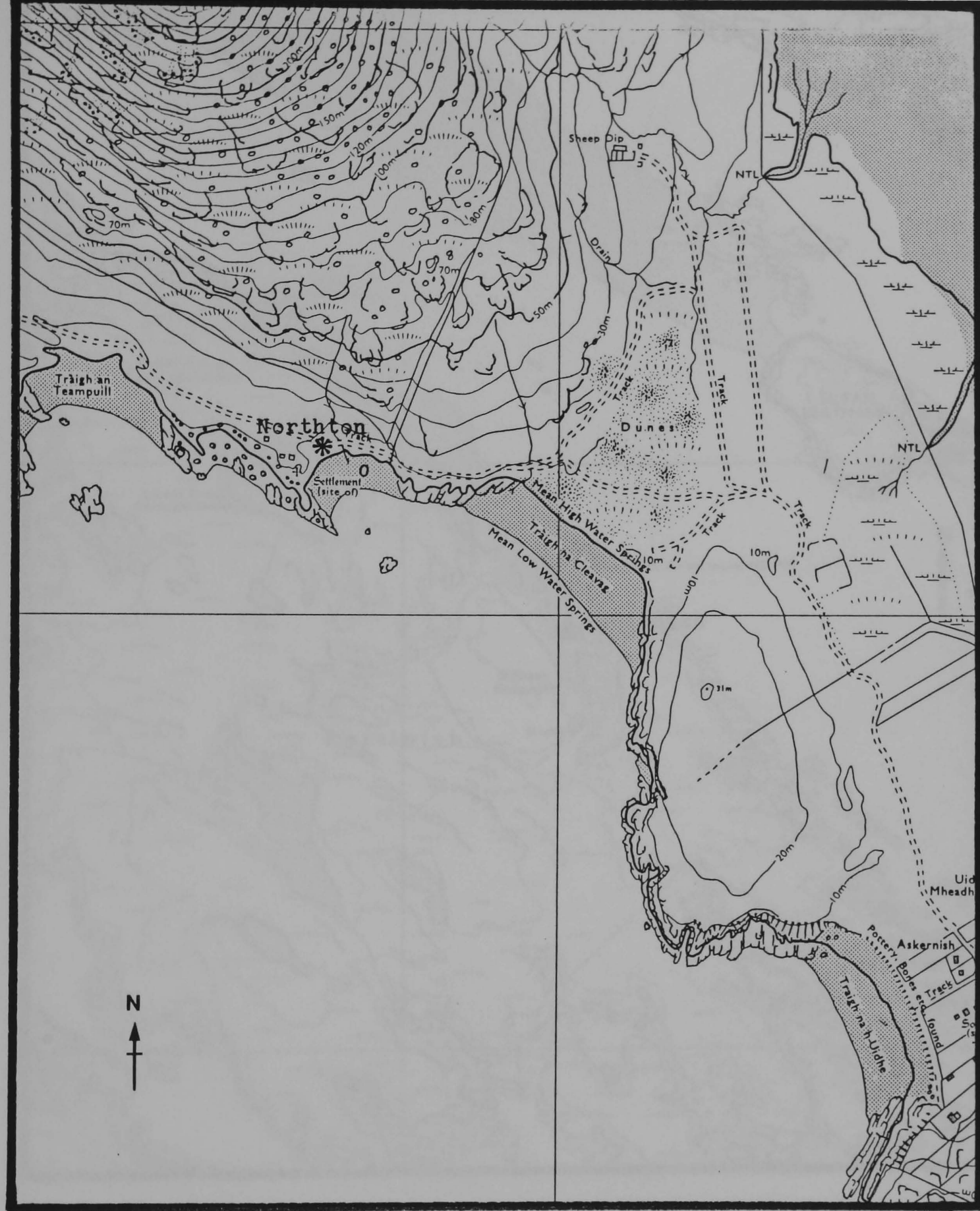


Figure 17. Location of the site at Northton, Harris.

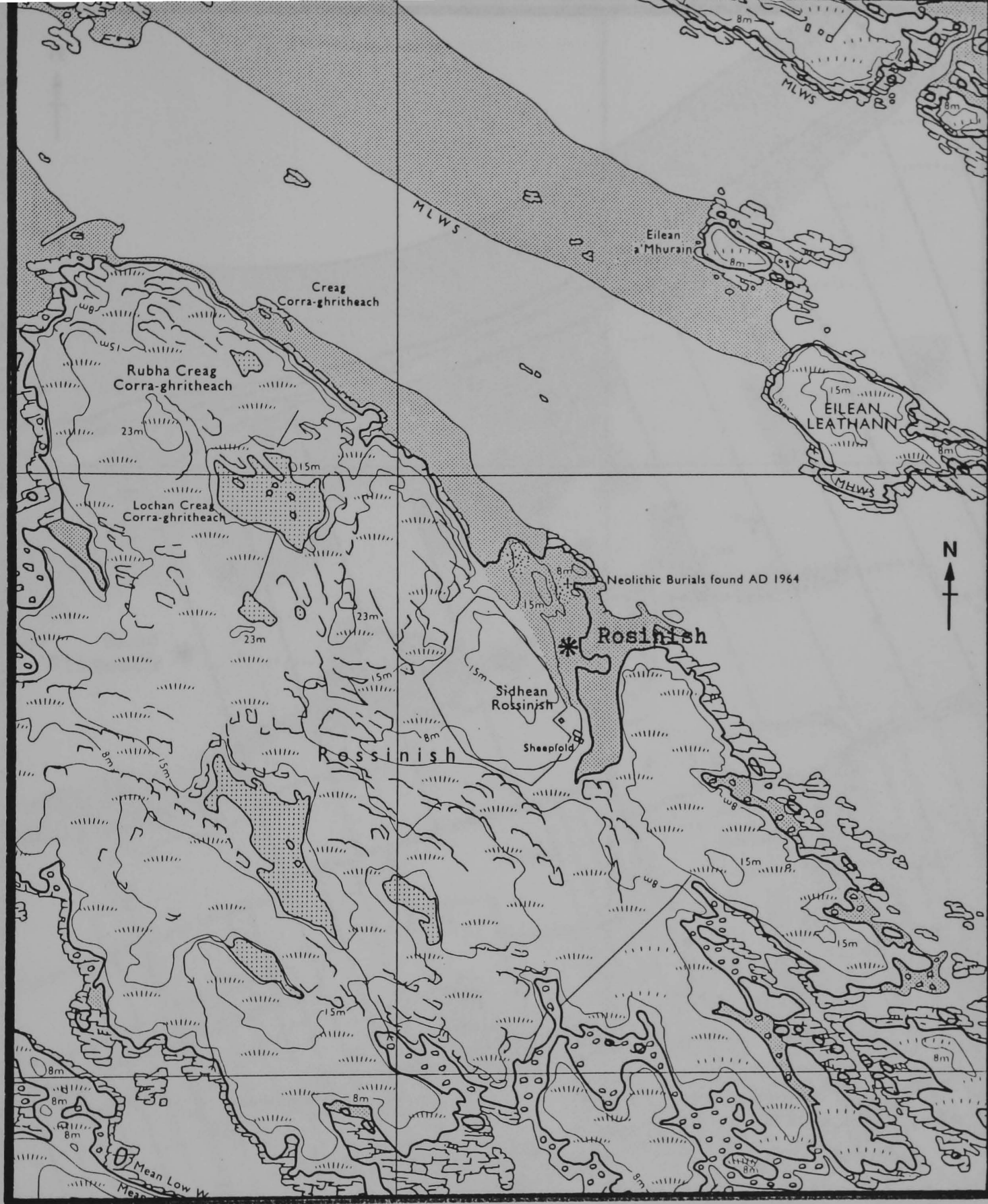


Figure 18. Location of the site at Rosinish, Benbecula.

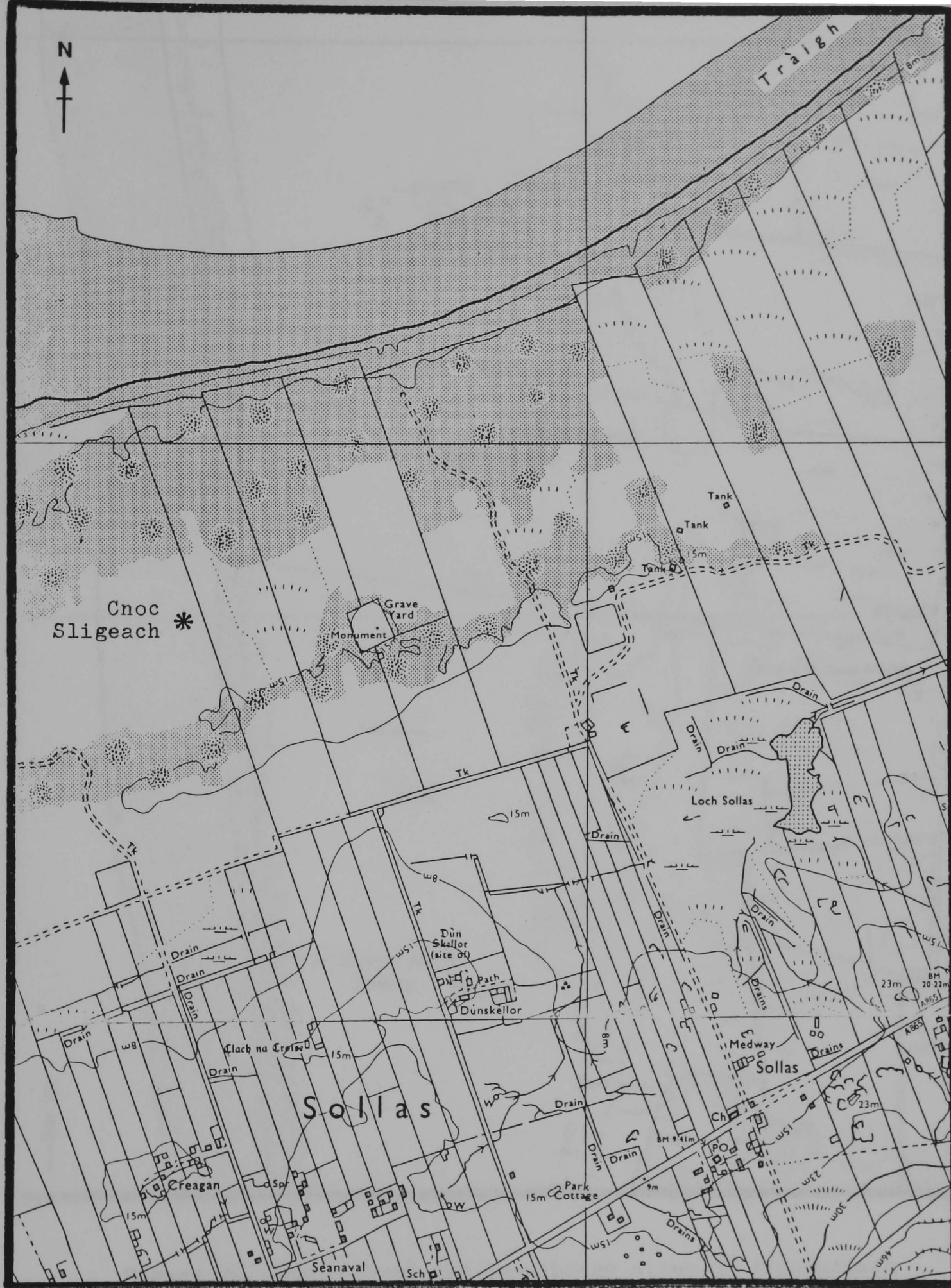


Figure 19. Location of the Wheelhouse site at Cnoc Sligeach, Sollas, North Uist.

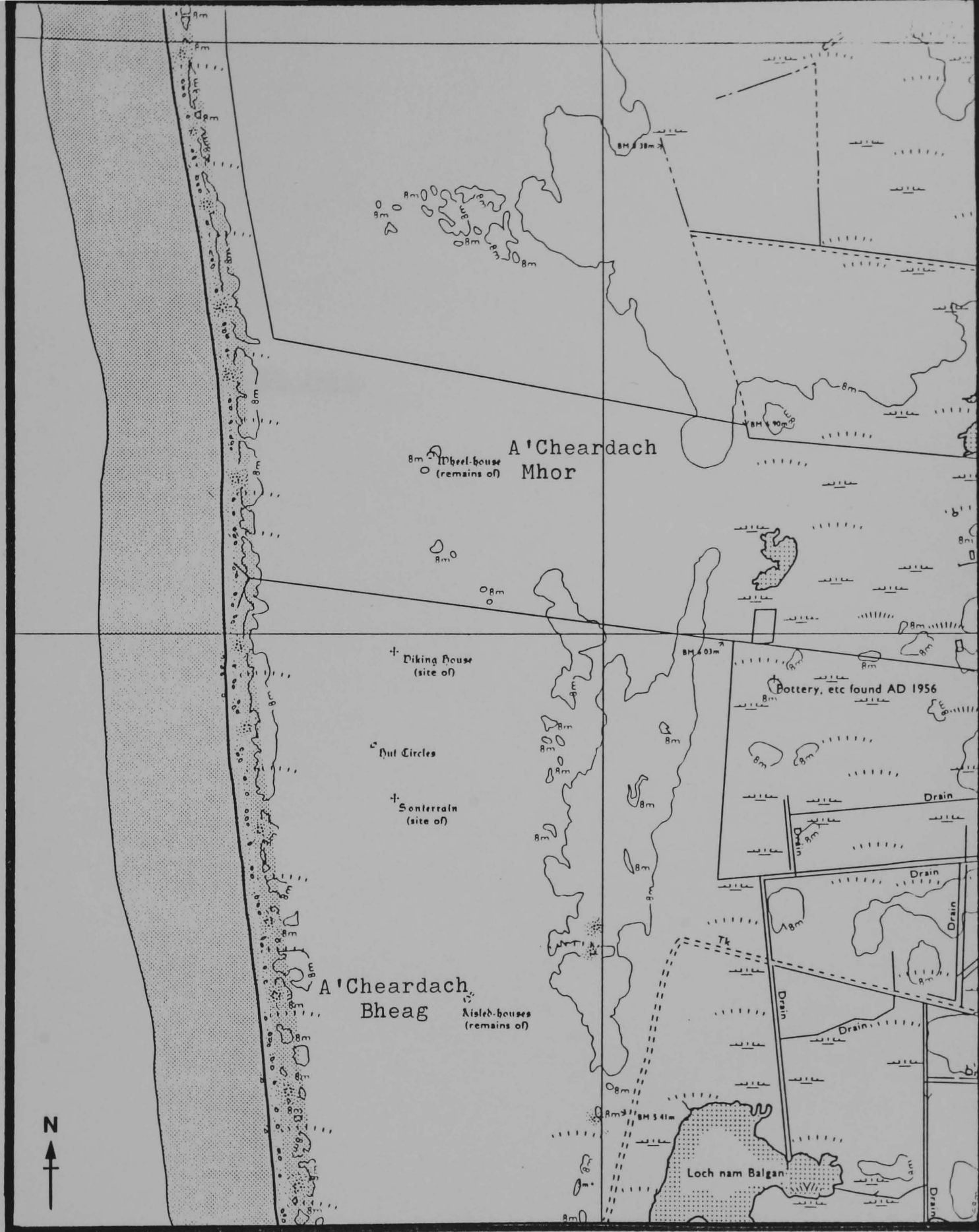


Figure 20. Location of the Wheelhouse sites of A'Cheardach Mhor and A'Cheardach Bheag, Drimore, South Uist.

TABLES 1-43.

Species	Neolithic Beaker	EBA	LBA/pre-WH	early WH	later WH/sq.	
Sheep	250* 21 teeth	19 22 teeth	81 48 teeth	121 14 teeth	338 30 teeth	1691 155 teeth
Cattle	96** 22 teeth	23 28 teeth	62 85 teeth	26 19 teeth	172 62 teeth	324 139 teeth
Pig	-	- 4 teeth	1	18 4 teeth	147 17 teeth	284 18 teeth
Red Deer	12 2 teeth	1 1 tooth	- 1 tooth	1	6 1 tooth	16 6 teeth
Dog	1	1	2	-	6	6
Seal	-	1	3	3	4	19
Whale	-	-	-	-	7	5
Birds	2	3	65	8	58	99 ⁺
Fish	10	3	134 ^{***}	-	36	244 ⁺⁺

* including 41 frags. and 19 frags. from 2 individuals

** including 20 frags. from 1 individual

*** including 85 frags. from 3 Cod and 18 frags. from 1 Rockling

+ including 15 frags. from 1 Song Thrush and 14 frags. from 1 Guillemot

++ including 34 frags. from 1 Cod and 80 frags. from 2 Saithe

Table 1.

The Udal - representation of species by number of fragments.

Species	Neolithic	Beaker	EBA	LBA/pre-WH	early WH	later WH/sq.
Sheep	10 1 neo.	3	6 1 neo.	3 1 neo.	9 1 neo.	30 3 neo. 6 foet.
Cattle	3 1 neo.	1 1 neo.	2 2 neo.	2	5 2 neo.	6 3 neo. 1 foet.
Pig	-	1	1	2 1 neo.	5 1 neo.	5 1 neo. 1 foet.

NB. 'neo.' indicates neo-natal animal
'foet.' indicates foetal animal

Table 2.
The Udal - Minimum Number estimates for main mammal species.

Species	Neolithic	Beaker	EBA	LBA/pre-WH	early WH	later WH/sq.
Sheep	250 69.8%	19 44.2%	81 56.2%	121 72.9%	338 51.0%	1691 73.0%
Cattle	96 26.8%	23 53.5%	62 43.1%	26 15.7%	172 25.9%	324 14.0%
Pig	-	-	1 0.7%	18 10.8%	147 22.2%	284 12.3%
Red Deer	12 3.4%	1 2.3%	-	1 0.6%	6 0.9%	16 0.7%
Total	358	43	144	166	663	2315

Table 3.
The Udal - relative percentage of main food mammals.

Method	Neolithic	Beaker	EBA	LBA/pre-WH	early WH	late WH/sq.
Fragment count	2.6:1	0.8:1	1.3:1	4.6:1	2.0:1	5.2:1
Minimum number estimate	3.3:1	3.0:1	3.0:1	1.5:1	1.8:1	5.0:1

Table 4.
The Udal - ratio of sheep:cattle.

Phase	humerus, femur, radius, tibia			metapodia		
	complete bones	identified frags.	% complete	complete bones	identified frags.	% complete
Neolithic	2	58	3.4%	1	38	2.6%
Beaker	-	-	-	-	4	-
EBA	1	29	3.4%	-	17	-
LBA/pre-WH	4	26	15.4%	7	15	46.7%
early WH	12	66	18.2%	9	27	33.3%
late WH/sq.	101	191	52.9%	67	113	59.3%
Total	120	370	32.4%	87	214	39.3%

Table 5.
The Udal - sheep fragmentation data for main meat-bearing bones (humerus, femur, radius, ulna) and for potentially most useful raw material bones (metapodia).

Phase	humerus, femur, radius, tibia			metapodia		
	complete bones	identified frags.	% complete	complete bones	identified frags.	% complete
Neolithic	-	12	-	-	16	-
Beaker	-	1	-	-	8	-
EBA	-	7	-	-	16	-
LBA/pre-WH	1	3	33.3%	-	4	-
early WH	1	8	12.5%	2	27	7.4%
late WH/sq.	6	38	15.8%	5	38	13.2%
Total	8	69	11.6%	7	109	6.4%

Table 6. The Udal - cattle fragmentation data (as Table 5).

Phase	humerus, femur, radius, tibia			metapodia		
	complete bones	identified frags.	% complete	complete bones	identified frags.	% complete
Neolithic	-	-	-	-	-	-
Beaker	-	-	-	-	-	-
EBA	-	-	-	-	-	-
LBA/pre-WH	-	1	-	7	7	100%
early WH	6	22	27.3%	17	22	77.3%
late WH/sq.	9	22	40.9%	25	35	71.4%
Total	15	45	33.3%	49	64	76.6%

Table 7. The Udal - pig fragmentation data (as Table 5).

Phase	humerus, femur, radius, tibia			metapodia		
	complete bones	identified frags.	% complete	complete bones	identified frags.	% complete
Neolithic	-	-	-	1	6	16.7%
Beaker	-	-	-	-	-	-
EBA	-	-	-	-	-	-
LBA/pre-WH	-	-	-	-	-	-
early WH	-	2	-	-	-	-
late WH/sq.	1	4	25%	-	-	-
Total	1	6	16.7%	1	6	16.7%

Table 8. The Udal - Red Deer fragmentation data (as Table 5).

Species	Neolithic Beaker	EBA	pre-WH	early WH	late WH/sq.
Fulmar	-	-	-	6	-
Manx Shearwater	-	-	-	-	3
Gannet	-	-	1	2	7
Shag	-	-	-	-	1
Goose <u>sp.</u>	-	-	3	-	1
Black Grouse	-	-	-	-	1
Oystercatcher	1	-	-	-	-
Turnstone	1	-	-	-	-
Lapwing	-	-	-	2	1
Knot	-	-	-	1	-
Redshank	-	-	2	-	-
Curlew	-	-	-	-	1
Bar-tailed Godwit	-	-	-	-	1
Woodcock	-	-	-	1	-
sm. gull cf. Black Headed	-	-	-	-	1
med. gull cf. Lesser Black-Back	-	-	-	-	1
med. gull cf. Herring	-	-	1	1	2
large gull cf. Greater Black-Back	-	-	-	2	4
Razorbill	-	-	-	1	5
Guillemot	-	-	2	-	2
Puffin	-	1	2	-	2
Great Auk	-	1	2	1	5
					8

* including 14 bones from 1 individual

Table 9 (i).

The Udal - bird species represented.

Species	Neolithic	Beaker	EBA	pre-WH	early WH	late WH/sq.
Skylark	-	-	1	1	-	2
Swallow	-	-	-	-	1	-
Pied Wagtail	-	-	-	-	3	5
Dunnock	-	-	-	-	-	6
Robin	-	-	-	-	4	3
Song Thrush	-	-	-	-	-	18*
Chaffinch	-	-	-	-	-	2
Twite	-	-	-	-	-	2
House Sparrow	-	-	-	-	2	1
Starling	-	-	2	-	7	17
sm. passerine	-	-	-	-	-	5
Nid.	-	1	49	4	18	58
Total	2	3	65	8	58	199

* including 15 bones from 1 individual

Table 9 (ii).

The Udal - bird species represented.

Species	Neolithic	Beaker	EBA	LBA/pre-WH	early WH	late WH/sq.
Sharks/Rays	2	2	2	-	2	4
Conger Eel	-	-	-	-	3	4
Cod	1	-	87	-	11	56
Haddock	-	-	-	-	1	2
Whiting	-	-	-	-	-	3
Saithe	-	-	-	-	1	84
Rockling	-	-	18	-	-	-
Ling	1	-	1	-	-	4
Cod family	-	-	-	-	-	6
Hake	-	-	-	-	-	1
Ballan Wrasse	2	-	1	-	2	3
Mackerel	-	-	-	-	1	-
Plaice	-	-	-	-	-	1
Flounder	-	-	-	-	1	1
Dab	-	-	1	-	-	-
Flatfish <u>sp.</u>	-	-	2	-	-	1
Not identified	4	1	22	-	14	65
Total	10	3	134	0	36	244

Table 10.

The Udal - fish species represented.

Age (months)	bone + epiphysis	Neolithic u. f.	Beaker u. f.	EBA u. f.
neo-natal	metapodial prox.	- 15	- 2	- 3
	% unfused	-	-	-
10	humerus dist. radius prox.	1 8	- -	2 1
	% unfused	11.1%	-	66.7%
13-16	phalange prox.	4 30	3 -	1 3
	% unfused	11.8%	100%	25.0%
18-24	metacarpal dist. tibia dist.	3 3	- -	1 1
	% unfused	50.0%	-	50.0%
20-28	metatarsal dist.	1 -	- -	- 2
	% unfused	100%	-	-
30-36	radius dist. ulna prox. femur prox.	19 11	- -	1 -
	% unfused	63.3%	-	100%
36-42	femur dist. tibia prox. humerus prox.	5 2	- -	- -
	% unfused	71.4%	-	-

Key.

u. unfused f. fused prox. proximal dist. distal

Table 11 (i).

The Udal - sheep epiphyseal fusion data (Silver, 1969).

Age (months)	bone + epiphysis	LBA/pre-WH u. f.	early WH u. f.	late WH/sq. u. f.
neo-natal	metapodial prox.	- 3	4 7	4 13
	% unfused	-	36.4%	23.5%
10	humerus dist. radius prox.	1 5	10 6	13 39
	% unfused	16.7%	62.5%	25.0%
13-16	phalange prox.	20 2	28 22	167 166
	% unfused	90.9%	56.0%	50.2%
18-24	metacarpal dist. tibia dist.	3 1	12 4	60 33
	% unfused	75.0%	75.0%	64.5%
20-28	metatarsal dist.	5 -	2 1	19 16
	% unfused	100%	66.7%	54.3%
30-36	radius dist. ulna prox. femur prox.	8 -	29 4	108 34
	% unfused	100%	87.9%	76.1%
36-42	femur dist. tibia prox. humerus prox.	9 -	22 -	60 33
	% unfused	100%	100%	64.5%

Key.

u. unfused f. fused prox. proximal dist. distal

Table 11 (ii).

The Udal - sheep epiphyseal fusion data (Silver, 1969).

Age (months)	Neolithic	Beaker	EBA	LBA/pre-WH	early WH	late WH/sq.
under 6	-	-	-	-	-	3 3.2%
6-18	-	-	-	-	1 5.6%	6 6.3%
6-30	2 66.7%	-	7 63.7%	1 14.3%	10 55.6%	52 54.7%
18-30	-	-	2 18.2%	2 28.6%	3 16.7%	6 6.3%
over 30	-	-	-	-	-	1 1.1%
over 40	1 33.3%	-	2 18.2%	4 57.1%	4 22.2%	27 28.4%
Total	3	-	11	7	18	95

Table 12.

The Udal - sheep tooth eruption (Silver, 1969).

Age (months)	bone + epiphysis	Neolithic u. f.	Beaker u. f.	EBA u. f.
neo-natal	metapodial prox. phalange dist.	- 9	1 4	- 9
	% unfused	-	20.0%	-
7-18	humerus dist. radius prox. scapula prox. phalange prox.	8 3	- -	8 8
	% unfused	72.7%	-	50.0%
24-36	metapodial distal tibia distal	7 1	1 -	1 1
	% unfused	87.5%	100%	50.0%
36-42	calcaneum	1 -	- -	1 -
	% unfused	100%	-	100%
42-48	tibia prox. humerus prox. radius dist. ulna femur dist. femur prox.	6 3	- -	- 1
	% unfused	66.7%	-	-

Key.

u. unfused f. fused prox. proximal dist. distal

Table 13 (i).

The Udal - cattle epiphyseal fusion data (Silver, 1969).

Age (months)	bone + epiphysis	LBA/pre-WH u. f.	early WH u. f.	late WH/sq. u. f.
neo-natal	metapodial prox. phalange dist.	1 3	1 13	19 9
	% unfused	25.0%	7.1%	67.9%
7-18	humerus dist. radius prox. scapula prox. phalange prox.	3 3	23 12	20 31
	% unfused	50.0%	65.7%	39.2%
24-36	metapodial dist. tibia dist.	- -	9 3	15 6
	% unfused	-	75.0%	71.4%
36-42	calcaneum	- -	5 1	10 1
	% unfused	-	83.3%	90.9%
42-48	tibia prox. humerus prox. radius dist. ulna femur dist. femur prox.	- 1	6 -	31 6
	% unfused	-	100%	83.8%

Key.

u. unfused f. fused prox. proximal dist. distal

Table 13 (ii).

The Udal - cattle epiphyseal fusion data (Silver, 1969)

Age (months)	Neolithic	Beaker	EBA	LBA/pre-WH	early WH	late WH/sq.
under 6	-	-	-	-	-	-
under 18	2 66.7%	1 50.0%	-	-	1 20.0%	11 64.7%
6-42	-	1 50.0%	-	-	-	1 5.9%
over 30	-	-	-	-	3 60.0%	2 11.8%
over 42	-	-	-	-	1 20.0%	2 11.8%
over 48	1 33.3%	-	1	-	-	-
Total	3	2	1	-	5	17

Table 14.

The Udal - cattle tooth eruption data (Silver, 1969).

Age (months)	bone + epiphysis	EBA		LBA/pre-WH	
		u.	f.	u.	f.
neo-natal	metapodial prox.	-	1	-	-
	% unfused	-		-	
12	scapula prox. humerus dist. radius prox. 2nd phalange prox.	-	-	-	-
	% unfused	-		-	
24	metacarpal dist. tibia dist. 1st phalange prox.	-	-	3	-
	% unfused	-		100%	
24-30	metatarsal dist. calcaneum fibula dist.	-	-	3	-
	% unfused	-		100%	
36-40	ulna prox. humerus prox. radius dist. femur prox. femur dist. tibia prox. fibula prox.	-	-	-	-
	% unfused	-		-	

Key.

u. unfused f. fused prox. proximal dist. distal

Table 15 (i).

The Udal - pig epiphyseal fusion data (Silver, 1969).

Age (months)	bone + epiphysis	early WH		late WH/sq.	
		u.	f.	u.	f.
neo-natal	metapodial prox.	-	-	1	3
	% unfused	25.0%			
12	scapula prox. humerus dist. radius prox. 2nd phalange prox.	6	9	33	15
	% unfused	40.0%		68.8%	
24	metacarpal dist. tibia dist. 1st phalange prox.	23	5	40	2
	% unfused	82.1%		95.2%	
24-30	metatarsal dist. calcaneum fibula dist.	12	-	13	2
	% unfused	100%		86.7%	
36-42	ulna prox. humerus prox. radius dist. femur prox. femur dist. tibia prox. fibula prox.	18	1	17	-
	% unfused	94.7%		100%	

Key.

u. unfused f. fused prox. proximal dist. distal

Table 15 (ii).

The Udal - pig epiphyseal fusion data (Silver, 1969).

Age (months)	Neolithic	Beaker	EBA	LBA/pre-WH	early WH	late WH/sq.
12-24	-	-	-	-	3 27.3%	4 36.4%
24-36	-	-	-	-	5 45.4%	5 45.4%
over 36	-	-	-	-	3 27.3%	2 18.2%
Total	-	-	-	-	11	11

Table 16. The Udal - pig tooth eruption data. (Silver, 1969).

Species	Neolithic	B VII	B V/VI	IA II	IA I
Sheep	219 195 teeth	91 97 teeth	21 39 teeth	19 9 teeth	26 38 teeth
Cattle	54 116 teeth	83 122 teeth	15 48 teeth	26 3 teeth	32 13 teeth
Pig	- 1 tooth	2	1	- 1 tooth	1
Red Deer	17 6 teeth	123 63 teeth	17 6 teeth	214	9 2 teeth
Horse	-	-	- 1 tooth	-	1 3 teeth
Dog	-	-	- 1 tooth	-	- 2 teeth
Seal	4 3 teeth	16 3 teeth	2	1 3 teeth	2
Bird	25	31	18	2	3
Fish	4	14	3	7	7
Whale	1	2	1	3	1
Otter	-	5	-	-	-
Badger	-	3	-	-	-

Table 17.

Northton - representation of species by number of fragments.

Species	Neolithic	B VII	B V/VI	IA II	IA I
Sheep	9 7 neo.	5 1 neo.	2 1 neo.	3 1 neo.	2
Cattle	4 1 neo.	3 1 neo.	1	2 1 neo.	3 1 neo.
Red Deer	1	7	1	8	2

'neo.' indicates neo-natal animal

Table 18.

Northton - Minimum Number estimates for main mammal species.

Species	Neolithic	B VII	B V/VI	IA II	IA I
Sheep	219 75.5%	91 30.4%	21 38.9%	19 7.3%	26 38.2%
Cattle	54 18.6%	83 27.8%	15 27.8%	26 10.0%	32 47.0%
Pig	-	2 0.7%	1 1.8%	-	1 1.5%
Red Deer	17 5.9%	123 41.4%	17 31.5%	214 82.6%	9 13.2%
Total	290	299	54	259	68

Table 19.

Northton - relative percentage of main food mammals.

Species	Neolithic	B VII	B V/VI	IA II	IA I
Cod	-	1	-	2	-
<u>Gadoid sp.</u>	-	-	-	2	3
Ling	-	10	-	-	1
Conger Eel	1	1	-	2	-
Ballan Wrasse	-	1	-	-	-
Nid.	3	1	3	1	3
Total	4	14	3	7	7

Table 20.

Northton - fish species represented.

Method	Neolithic	B VII	B V/VI	IA II	IA I	(mean)
Fragment count	4.0:1	1.1:1	1.4:1	0.7:1	0.8:1	1.6:1
Minimum number estimate	2.2:1	1.7:1	2.0:1	1.5:1	0.7:1	1.6:1

Table 21.

Northton - ratio of sheep:cattle.

Species	Neolithic	B VII	B V/VI	IA II	IA I
Shag	2	2	1	-	-
Gannet	4	-	2	1	-
Guillemot	6	3	1	-	-
Puffin	2	5	2	-	-
Redshank	1	2	-	-	-
Blackbird	2	-	-	-	-
Medium gull cf. Herring	2	-	-	-	-
Fieldfare	-	2	-	-	-
Small gull cf. Kittiwake	-	1	-	-	-
Raven	-	1	-	-	-
Goosander	-	1	-	-	-
Red-throated Diver	-	1	-	-	-
Cormorant	-	5	3	-	-
Great Auk	-	-	1	-	-
Little Auk	-	-	1	-	-
Stork	-	-	1	-	1
Nid.	6	8	6	1	2
Total	25	31	18	2	3

Table 22.

Northton - bird species represented.

Age (months)	bone + epiphysis	Neolithic u. f.	B VII u. f.	B V/VI u. f.
neo-natal	metapodial prox.	3 12	1 10	- 1
	% unfused	20.0%	9.1%	-
10	humerus dist. radius prox.	12 16	1 5	- 1
	% unfused	42.9%	16.7%	-
13-16	1st phalange prox. 2nd phalange prox.	- 8	1 2	1 1
	% unfused	-	33.3%	50.0%
18-24	metacarpal dist. tibia dist.	3 3	2 2	- -
	% unfused	50.0%	50.0%	-
20-28	metatarsal dist.	2 2	1 1	- -
	% unfused	50.0%	50.0%	-
30-36	radius dist. ulna prox. femur prox.	20 4	- -	- 1
	% unfused	83.3%	-	-
36-42	femur dist. tibia dist. humerus prox.	8 1	2 -	- 1
	% unfused	88.9%	-	-

Key.

u. unfused f. fused prox. proximal dist. distal

Table 23 (i).

Northton - sheep epiphyseal fusion data (Silver, 1969).

Age (months)	bone + epiphysis	IA II u. f.	IA I u. f.
neo-natal	metapodial prox.	1 4	- 6
	% unfused	20.0%	-
10	humerus dist. radius prox.	- -	- 4
	% unfused	-	-
13-16	1st phalange prox. 2nd phalange prox.	- -	- 6
	% unfused	-	-
18-24	metacarpal dist. tibia dist.	- -	- 1
	% unfused	-	-
20-28	metatarsal dist.	- -	1 -
	% unfused	-	100%
30-36	radius dist. ulna prox. femur prox.	2 -	- 1
	% unfused	100%	-
36-42	femur dist. tibia prox. humerus prox.	1 -	1 1
	% unfused	100%	50.0%

Key.

u. unfused f. fused prox. proximal dist. distal

Table 23 (ii).

Northton - sheep epiphyseal fusion data (Silver, 1969).

Age (months)	bone + epiphysis	Neolithic u. f.	B VII u. f.	B V/VI u. f.
neo-natal	metapodial prox. phalange dist.	1 17	- 19	- 2
	% unfused	5.6%	-	-
7-18	humerus dist. radius prox. scapula prox. 1st phalange prox. 2nd phalange prox.	- 14	3 15	2 2
	% unfused	-	16.7%	50.0%
24-36	metapodial dist. tibia dist.	2 -	3 -	- 1
	% unfused	100%	100%	-
36-42	calcaneum	2 -	- -	- -
	% unfused	100%	-	-
42-48	humerus prox. radius dist. ulna femur dist. femur prox. tibia prox.	7 -	2 -	- -
	% unfused	100%	100%	-

Key.

u. unfused f. fused prox. proximal dist. distal

Table 24 (i).

Northton - cattle epiphyseal fusion data (Silver, 1969).

Age (months)	bone + epiphysis	IA II u. f.	IA I u. f.
neo-natal	metapodial prox. phalange dist.	1 2	1 10
	% unfused	33.3%	9.1%
7-18	humerus dist. radius prox. scapula prox. 1st phalange prox. 2nd phalange prox.	2 1	- 8
	% unfused	66.7%	-
24-36	metapodial dist. tibia dist.	1 -	1 -
	% unfused	100%	100%
36-42	calcaneum	2 1	- 1
	% unfused	66.7%	-
42-48	humerus prox. radius dist. ulna femur dist. femur prox. tibia prox.	4 1	- 2
	% unfused	80.0%	-

Key.

u. unfused f. fused prox. proximal dist. distal

Table 24 (ii).

Northton - cattle epiphyseal fusion data (Silver, 1969).

Age (months)	Neolithic	B VII	B V/VI	IA II	IA I
6-30	14 51.9%	5 50.0%	-	-	3
18-30	1 3.7%	-	-	-	-
over 30	1 3.7%	-	-	-	-
over 40	11 40.8%	5 50.0%	-	1	-
Total	27	10	-	1	3

Table 25.

Northton - sheep tooth eruption data, (Silver, 1969).

Age (months)	Neolithic	B VII	B V/VI	IA II	IA I
6-18	2	2	-	-	-
over 30	-	1	-	-	1
over 42	-	1	-	-	-
over 48	-	-	1	-	-
Total	2	4	1	-	1

Table 26.

Northton - cattle tooth eruption data, (Silver, 1969).

Species	pre-WH/B midden	WH/A	post-WH/B refill
Sheep	98 31 teeth	374 85 teeth	12 1 tooth
Cattle	139 62 teeth	158 109 teeth	20 9 teeth
Pig	14 4 teeth	20 23 teeth	1 1 tooth
Red Deer	4	5 1 tooth	1
Horse	2	1	1 1 tooth
Dog	-	2 3 teeth	-
Seal	-	2	-
Whale	10	5	-
Bird	6	8	2
Fish	1	10	-

Table 27.

Sollas - representation of species by number of fragments.

Species	pre-WH/B midden		WH/A		post-WH/B refill	
	frags.	MNI	frags.	MNI	frags.	MNI
Sheep	98 38.1%	7 58.3%	374 67.0%	14 66.7%	12 34.3%	1 16.7%
Cattle	139 54.1%	2 16.7%	158 28.3%	4 19.0%	20 57.1%	2 33.3%
Pig	14 5.4%	1 8.3%	5 0.9%	1 4.8%	1 2.9%	1 16.7%
Red Deer	4 1.6%	1 8.3%	20 3.6%	1 4.8%	1 2.9%	1 16.7%
Horse	2 0.8%	1 8.3%	1 0.2%	1 4.8%	1 2.9%	1 16.7%
Total	257	12	558	21	35	6

Table 28.

Sollas - relative representation of main food mammals by number of fragments (frags.) and by estimated minimum number of individuals (MNI).

Species	pre-WH/B midden	WH/A	post-WH/B refill
Sheep	1	2	-
Cattle	1	2	1
Pig	-	-	-
Red Deer	-	-	-
Horse	-	-	-

Table 29.

Sollas - incidence of neo-natal animals by estimated minimum number of individuals (MNI).

Age (months)	bone + epiphysis	WH/A		pre-WH/B		post-WH/B	
		u.	f.	u.	f.	u.	f.
neo-natal	metapodial prox.	1	7	2	4	-	-
	% unfused	12.5%		33.3%			
10	humerus dist. radius prox.	11	15	1	3	-	-
	% unfused	42.3%		25.0%			
13-16	1st phalange prox. 2nd phalange prox.	26	43	3	3	-	-
	% unfused	37.7%		50.0%			
18-24	metacarpal dist. tibia dist.	25	20	3	-	-	-
	% unfused	55.6%		-			
20-28	metatarsal dist.	11	8	-	2	-	-
	% unfused	57.9%		-			
30-36	radius dist. ulna prox. femur prox.	15	10	7	1	-	-
	% unfused	60.0%		87.5%			
36-42	femur dist. tibia prox. humerus prox.	19	19	3	3	-	-
	% unfused	50.0%		50.0%			

Key.

u. unfused f. fused prox. proximal dist. distal

Table 30.

Sollas - sheep epiphyseal fusion data for 'domestic' contexts

(Silver, 1969)

Age (months)	pre-WH/B midden	WH/A	post-WH/B refill
under 6	-	1 2.4%	-
6-18	-	1 2.4%	-
6-30	2 22.2%	8 19.0%	1
18-30	2 22.2%	7 16.7%	-
over 30	1 11.1%	2 4.8%	-
over 40	4 44.4%	23 54.8%	-
Total	9	42	1

Table 31.

Sollas - sheep tooth eruption data-(Silver, 1969).

Age (months)	pre-WH/B midden	WH/A	post-WH/B refill
12-24	1	3	-
24-36	-	-	-
over 36	-	1	-
Total	1	4	0

Table 32.

Sollas - pig tooth eruption data-(Silver, 1969).

Species	pre-WH/B midden	WH/B	post-WH/B refill	WH/A
Fulmar	3	1	-	-
Manx Shearwater	-	1	-	-
Gannet	1	2	-	1
Shag	-	2	-	-
Goose <u>sp.</u>	-	1	-	-
Black Grouse	-	1	-	-
Medium gull (cf. Herring Gull)	-	5	-	-
Large gull (cf. Great Black Back)	-	-	-	1
Razorbill	-	1	-	-
Guillemot	-	1	-	-
Puffin	-	1	-	-
Great Auk	-	5	-	2
Red-throated Diver	-	-	-	1
Pied Wagtail	-	5	-	-
Fieldfare	1	-	-	-
Sparrow	-	1	-	-
Starling	-	3	-	-
Crow family	-	1	1	-
Nid.	1	12	1	3
Total	6	43	2	8

Table 33.

Sollas - bird species represented.

Species	WH/A	pre-WH/B midden	WH/B	post-WH/B refill
Cod	-	-	4	-
Saithe	-	-	11	-
Cod family	13	-	5	-
cf. Sculpin/ Bullhead	-	-	1	-
Nid.	-	1	2	-
Total	13	1	23	0

Table 34.

Sollas - fish species represented.

Phase	humerus, femur, radius, tibia			metapodia		
	complete bones	identified frags.	% complete	complete bones	identified frags.	% complete
WH/A	40	143	28.0%	31	58	53.4%
pre-WH/B midden	6	28	21.4%	1	11	9.1%
post-WH/B refill	-	2	-	-	3	-
Total	46	173	26.6%	32	72	44.4%

Table 35.

Sollas - sheep fragmentation data for main meat-bearing bones (humerus, femur, radius, tibia) and for potentially most useful raw material bones (metapodia).

NB. neo-natal bones not included in count.

Species	Phase I	Phase IA	Phase II
Sheep	121 7 teeth	7 3 teeth	3
Cattle	69 43 teeth	3 7 teeth	10 5 teeth
Pig	4 4 teeth	2 5 teeth	1
Red Deer	4 2 teeth	-	-
Dog	-	-	1
Whale	2	-	1
Bird	2	-	1
Fish	2	-	-

Table 36.

A'Cheardach Mhor - representation of species by number of fragments.

Species	Phase I	Phase IA	Phase II
Sheep	121 61.6%	7* 58.3%	3 21.4%
Cattle	69 34.8%	3 25.0%	10 71.4%
Pig	4 2.0%	2 16.7%	1 7.1%
Red Deer	4 2.0%	-	-
Total	198	12	14

* not including complete neo-natal lamb

Table 37.

A'Cheardach Mhor - representation of main mammal species by number of fragments.

Species	Phase I	Phase IA	Phase II
Fulmar	1	-	-
Swan	1	-	-
Puffin	-	-	1
Total	2	0	1

Table 38.

A'Cheardach Mhor - bird species represented.

Species	Phase I	Phase IA	Phase II
Pollack	1	-	-
Cod	1	-	-
Total	2	0	0

Table 39.

A'Cheardach Mhor - fish species represented.

Species	WHI	WHII	entrance complex	furnace
Sheep	23 [*] 5 teeth	5 2 teeth	1 3 teeth	-
Cattle	19 12 teeth	5 4 teeth	4 4 teeth	-
Pig	1 3 teeth	-	1 2 teeth	-
Red Deer	9 ^{**} 55 teeth	-	-	1
Dog	9	1	-	-
Seal	-	-	1	-
Whale	18	-	-	-
Bird	1	-	1	-
Fish	-	-	1	-

* not including remains of at least 2 lambs, probably just under 1 year old

** including as many mandibles as could be reconstructed

Table 40.

A'Cheardach Bheag - representation of species by number of fragments.

Species	WHI	WHII	entrance complex	furnace
Sheep	23* 44.2%	5 50.0%	1 16.7%	-
Cattle	19 36.5%	5 50.0%	4 66.7%	-
Pig	1 1.9%	-	1 16.7%	-
Red Deer	9** 17.3%	-	-	1
Total	52	10	6	1

* not including remains of at least 2 complete lambs, probably just under 1 year old

** including as many mandibles as could be reconstructed

Table 41.

A'Cheardach Bheag - representation of main mammal species by number of fragments.

Species	WHI	WHII	entrance complex	furnace
Goose	1	-	1	-

Table 42.

A'Cheardach Bheag - bird species represented.

Species	Bruach a Tuath	Bruach Ban
Sheep	37 8 teeth	17
Cattle	35 9 teeth	15 9 teeth
Pig	2 2 teeth	5 1 tooth
Red Deer	-	3
Whale	1	3
Bird	1	-

Table 43.

Bruach a Tuath and Bruach Ban - representation of species
by number of fragments.

APPENDICES

Appendix 1.

Abnormalities in the faunal material from:

Sollas, North Uist

Northton, Harris

the Udal, North Uist

A'Cheardach Mhor, South Uist

Abnormalities in the faunal remains from Sollas, North Uist.

by Dr. W. M. Stokoe and Dr. S. A. Kempson, Anatomy Dept.,
Royal (Dick) School of Veterinary Studies, Edinburgh
and Dr. R. Sprinz, Anatomy Dept., Edinburgh University
Medical School.

WH/A/5	Sheep	- rib fragment with healed fracture site. - maxilla fragment with slight evidence of periodontal decay.
WH/A/52	Horse	- rib with small, round lesion at tubercle, probably abscess - common in this position in horses.
WH/A/2	Sheep	- mandible with 'pitting' of alveolus due to periodontal decay - also accessory mandibular foramen at P2 on buccal side.
WH/A/69	Sheep	- axis with necrosis of caudal epiphysis due to arthritis of the articular cartilage/synovial joint.
WH/A/75	Cattle	- humerus with abnormally deep olecranon fossa is merely an extreme example of individual variation within the species.
WB 13/8	Cattle	- mandible with accessory mandibular foramen at p2 on lingual side.
WB ES/3	Cattle	- astragalus with distal lesion, merely a variant on the synovial fossa, probably indicating domestication since it is generally caused by food change.
WB 13/8	Cattle	- canine tooth shows the typical lingual fossae and the fissure running apically across the cingulum, but there appears to be some malformation labially which in the normal tooth does not show the extensive shallow depression present on this specimen.

Abnormalities in the faunal remains from Northton, Harris.

Neolithic	Sheep	- 3 ribs with healed fracture sites. - maxilla fragment with P4 twisted in its socket - this is common and not detrimental to the health of the animal.
Iron Age II	Red Deer	- astragalus with destruction of the bone cortex and 'grooving' of distal articular surface - due to arthritis.

Abnormalities in the faunal remains from The Udal, North Uist.

by Dr. S. A. Kempson, Anatomy Dept., Royal (Dick) School of
Veterinary Studies, Edinburgh.

- | | | |
|----------|--------|---|
| US 1094 | Cattle | - TC+4 tarsal with osteoporosis due to bone resorption - could be caused by trauma or deficiency disease. |
| US 21669 | Sheep | - radius/ulna proximal with definite exostoses indicating early arthritic changes. |
| US 24778 | Sheep | - mandible fragment with slight periodontal decay. |

Abnormalities in the faunal remains from A'Cheardach Mhor, South Uist.

by Dr. S. A. Kempson, Anatomy Dept., Royal (Dick) School of
Veterinary Studies, Edinburgh.

- | | | |
|---------|--------|---|
| W/56 | Cattle | - astragalus with slight osteoporosis. |
| W/71 | Cattle | - 1st phalanx with osteophytes at proximal. |
| W/73+77 | Sheep | - 2 metacarpals with definite pathological changes along the shaft as a result of inflammation of the periosteum, could possibly have been caused by hobbles?
- metatarsal with definite changes at proximal, exostosis possibly due to osteo-arthritis. |

Appendix 2.

Measurements of animal bones from:

Sollas, North Uist

Northton, Harris

A'Cheardach Mhor, South Uist

the Udal, North Uist

NB.

All measurements were made after von den Driesch (1976) to which reference should be made for a verbal and pictorial explanation of the abbreviated names of the various measurements.

Where possible measurements have been expressed in summarized form as mean, minimum, maximum, standard deviation, variance and number of cases represented. Where only a single example was measurable it has merely been listed.

The Udal sample is not complete as synthesis of the material is still in progress, so only the sheep bone and the most frequently represented of the cattle bone is summarized.

Measurements of sheep bones from Sollas, North Uist.

Femur GLC 143.5 SD 13.0 DC 17.0

Tibia GL 175.5 Bp 33.0 Bd 21.5 SD 11.0

Ulna LO 42.0 DPA 23.0 SDO 20.0 BPC 17.5

mean minimum maximum std.dev. variance no.

Humerus

<u>GL</u>	126.333	120.500	134.000	6.934	48.083	3
<u>Bp</u>	33.000	-	-	-	-	1
<u>Bd</u>	25.000	24.500	25.500	0.500	0.250	3
<u>SD</u>	12.167	10.500	13.500	1.528	2.333	3
<u>BT</u>	24.500	24.000	25.000	0.707	0.500	2

Metacarpal

<u>G1</u>	117.667	110.000	122.000	6.658	44.333	3
<u>Bp</u>	19.833	19.000	20.500	0.764	0.583	3
<u>Bd</u>	21.833	21.000	22.500	0.764	0.583	3
<u>SD</u>	11.250	11.000	11.500	0.354	0.125	2
<u>DD</u>	8.167	8.000	8.500	0.289	0.083	3

Metatarsal

<u>G1</u>	122.000	-	-	-	-	1
<u>Bp</u>	18.167	17.000	19.500	1.258	1.583	3
<u>Bd</u>	20.750	20.500	21.000	0.354	0.333	3
<u>SD</u>	10.333	10.000	11.000	0.577	0.333	3
<u>DD</u>	8.833	8.500	9.000	0.288	0.083	3

Calcaneum

<u>G1</u>	49.100	45.000	52.000	2.967	8.800	5
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	<u>mean</u>	<u>minimum</u>	<u>maximum</u>	<u>std.dev.</u>	<u>variance</u>	<u>no.</u>
<u>Astragalus</u>						
<u>GLl</u>	25.000	24.000	26.000	0.764	0.583	7
<u>Dl</u>	14.071	13.000	15.000	0.787	0.619	7
<u>GLm</u>	23.786	22.500	25.000	0.951	0.905	7
<u>Dm</u>	14.714	14.000	15.500	0.636	0.405	7
<u>Bd</u>	16.214	15.000	17.500	0.809	0.655	7

2nd phalange

<u>G1</u>	19.833	19.000	21.000	0.661	0.438	9
<u>SD</u>	7.555	6.500	8.000	0.527	0.278	9
<u>Bp</u>	10.444	9.000	11.500	0.808	0.653	9
<u>Bd</u>	8.429	7.000	9.500	0.787	0.619	7

1st phalange

<u>GLpe</u>	30.455	28.500	33.000	1.379	1.903	22
<u>SD</u>	8.636	7.000	9.500	0.539	0.292	22
<u>Bp</u>	10.738	9.000	12.000	0.682	0.465	21
<u>Bd</u>	9.682	8.000	11.000	0.824	0.680	22

Measurements of cattle bones from Sollas, North Uist.

Metacarpal Bd 49.5

Metatarsal Bd 46.5

	<u>mean</u>	<u>minimum</u>	<u>maximum</u>	<u>std.dev.</u>	<u>variance</u>	<u>no.</u>
<u>3rd phalange</u>						
<u>DLS</u>	61.833	58.000	64.500	3.403	11.583	3
<u>Ld</u>	44.750	43.500	46.000	1.768	3.125	2
<u>MBS</u>	19.250	18.000	20.500	1.768	3.125	2

	<u>mean</u>	<u>minimum</u>	<u>maximum</u>	<u>std.dev.</u>	<u>variance</u>	<u>no.</u>
<u>Scapula</u>						
<u>LG</u>	51.250	47.000	55.500	6.010	36.125	2
<u>GLP</u>	60.250	55.500	65.000	6.718	45.125	2
<u>BG</u>	39.000	-	-	-	-	1
<u>SLC</u>	46.500	37.500	54.500	8.544	73.000	3

<u>Astragalus</u>						
<u>GLm</u>	46.500	44.000	49.000	3.535	12.500	2
<u>Dm</u>	26.250	26.000	26.500	0.353	0.125	2
<u>GLl</u>	51.250	47.500	55.000	5.303	28.125	2
<u>Dl</u>	31.000	-	-	-	-	1
<u>Bd</u>	32.000	30.000	34.000	2.828	8.000	2

<u>1st phalange</u>						
<u>GLpe</u>	52.750	51.000	54.500	2.475	6.125	2
<u>Bp</u>	26.000	25.000	27.000	1.000	1.000	3
<u>SD</u>	20.750	20.500	21.000	0.353	0.125	2
<u>Bd</u>	24.000	23.000	25.000	1.414	2.000	2

<u>2nd phalange</u>						
<u>G1</u>	35.667	35.000	37.000	1.155	1.333	3
<u>Bp</u>	26.667	25.500	29.000	2.020	4.083	3
<u>SD</u>	20.167	18.500	22.500	2.082	4.333	3
<u>Bd</u>	20.000	20.000	20.000	0.000	0.000	2

Measurements of Red Deer bones from Sollas, North Uist.

Ulna LQ 55.5 SDQ 33.0

Scapula LG 39.5 GLP 49.0 SLC 31.0

Measurements of sheep bones from Northton, Harris.

1st phalange

<u>GLPe</u>	<u>mean</u>	<u>minimum</u>	<u>maximum</u>	<u>std. dev.</u>	<u>variance</u>	<u>no</u>
Neolithic	31.667	30.000	33.000	1.528	2.333	3
Iron Age I	30.500	28.000	33.000	3.536	12.500	2

SD

Neolithic	8.667	8.500	9.000	0.289	0.083	3
Iron Age I	8.667	8.000	9.000	0.577	0.333	3

Bp

Neolithic	11.000	11.000	11.000	0.000	0.000	3
Iron Age I	10.500	9.500	11.500	1.414	2.000	2

Bd

Neolithic	10.000	9.500	10.500	0.500	0.250	3
Iron Age I	10.000	9.000	11.000	1.000	1.000	3

2nd phalange

G1

Neolithic	19.750	19.500	20.000	0.354	0.125	2
Beaker VII	21.250	20.500	22.000	1.061	1.125	2
Beaker V/VI	21.000	-	-	-	-	1

SD

Neolithic	7.000	6.500	7.500	0.707	0.500	2
Beaker VII	8.000	7.500	8.500	0.707	0.500	2
Beaker V/VI	8.500	-	-	-	-	1

Bp

Neolithic	11.000	10.500	11.500	0.707	0.500	2
Beaker VII	10.500	10.000	11.000	0.707	0.500	2
Beaker V/VI	10.000	-	-	-	-	1

	<u>mean</u>	<u>minimum</u>	<u>maximum</u>	<u>std. dev.</u>	<u>variance</u>	<u>no.</u>
<u>Bd</u>						
Neolithic	7.750	7.500	8.000	0.354	0.125	2
Beaker VII	9.750	9.500	10.000	0.354	0.125	2
Beaker V/VI	10.000	-	-	-	-	1

Humerus

Iron Age I	<u>GLC</u>	138.500	<u>SD</u>	16.500	<u>Bd</u>	30.000	<u>BT</u>	29.000
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Radius

Iron Age I	<u>GL</u>	156.000	<u>Bp</u>	29.500	<u>BFp</u>	28.000	<u>SD</u>	17.500
	<u>Bd</u>	27.500	<u>BFd</u>	26.000				

Metacarpal

Iron Age I	<u>GL</u>	104.500	<u>SD</u>	15.000	<u>Bp</u>	23.000	<u>Bd</u>	26.500
	<u>DD</u>	9.500						

Femur

Neolithic	<u>Bp</u>	40.000	<u>SD</u>	19.000
Beaker V/VI	<u>Bd</u>	33.000		

Metatarsal

Neolithic	<u>GL</u>	124.000	<u>SD</u>	9.500	<u>Bp</u>	17.500	<u>Bd</u>	21.500
	<u>DD</u>	8.000						

	<u>mean</u>	<u>minimum</u>	<u>maximum</u>	<u>std. dev.</u>	<u>variance</u>	<u>no.</u>
<u>Calcaneum</u>						
<u>G1</u>						
Neolithic	51.500	50.000	53.000	2.121	4.500	2
Beaker V/VI	54.000	-	-	-	-	1
Iron Age I	51.000	-	-	-	-	1
<u>GB</u>						
Neolithic	18.000	-	-	-	-	1
Iron Age I	19.500	-	-	-	-	1
<u>Astragalus</u>						
<u>GL1</u>						
Neolithic	26.800	25.000	28.500	1.255	1.575	5
Beaker VII	25.500	25.000	26.000	0.577	0.333	4
<u>D1</u>						
Neolithic	14.700	14.000	15.000	0.447	0.200	5
Beaker VII	14.500	13.500	15.000	0.866	0.750	3
<u>GLm</u>						
Neolithic	26.000	25.000	27.000	0.791	0.625	5
Beaker VII	25.000	23.500	26.000	1.080	1.167	4
<u>Dm</u>						
Neolithic	15.000	15.000	15.000	0.000	0.000	3
<u>Bd</u>						
Neolithic	17.100	16.500	17.500	0.418	0.175	5
Beaker VII	17.125	16.000	18.000	0.854	0.729	4

Measurements of cattle bones from Northton, Harris.

		<u>mean</u>	<u>minimum</u>	<u>maximum</u>	<u>std.dev.</u>	<u>variance</u>	<u>no.</u>
<u>Scapula</u>							
<u>GLP</u>	Neolithic	70.500	70.000	71.000	0.707	0.500	2
<u>LG</u>	Neolithic	61.250	60.000	62.500	1.768	3.125	2
<u>BG</u>	Neolithic	48.750	47.500	50.000	1.768	3.125	2
<u>1st phalange</u>							
<u>GLpe</u>							
	Neolithic	60.750	59.500	62.000	1.768	3.125	2
	Beaker VII	48.500	-	-	-	-	1
<u>Bp</u>							
	Neolithic	28.250	27.500	29.000	1.061	1.125	2
	Beaker VII	23.000	-	-	-	-	1
<u>SD</u>							
	Neolithic	24.000	23.000	25.000	1.4142	2.000	2
	Beaker VII	19.000	-	-	-	-	1
<u>Bd</u>							
	Neolithic	27.000	27.000	27.000	0.000	0.000	2
	Beaker VII	21.500	-	-	-	-	1
<u>2nd phalange</u>							
<u>G1</u>							
	Neolithic	39.500	38.500	41.000	1.323	1.750	3
	Beaker VII	42.000	-	-	-	-	1
	Iron Age I	35.000	-	-	-	-	1

	<u>mean</u>	<u>minimum</u>	<u>maximum</u>	<u>std.dev.</u>	<u>variance</u>	<u>no.</u>
<u>Bp</u>						
Neolithic	28.667	28.000	29.500	0.764	0.583	3
Beaker VII	42.000	-	-	-	-	1
Iron Age I	35.000	-	-	-	-	1
<u>SD</u>						
Neolithic	21.667	21.000	22.000	0.577	0.333	3
Beaker VII	21.500	-	-	-	-	1
Iron Age I	21.000	-	-	-	-	1
<u>Bd</u>						
Neolithic	23.500	22.500	24.500	1.000	1.000	3
Beaker VII	24.500	-	-	-	-	1
Iron Age I	21.000	-	-	-	-	1
<u>Astragalus</u>						
<u>GLl</u>						
Iron Age I	54.500	-	-	-	-	1
Iron Age II	57.167	56.500	58.000	0.764	0.583	3
<u>Dl</u>						
Iron Age II	33.750	33.500	34.000	0.354	0.125	2
<u>GLm</u>						
Iron Age I	49.750	49.500	50.000	0.354	0.125	2
Iron Age II	52.000	52.000	52.000	0.000	0.000	3
<u>Dm</u>						
Iron Age I	30.500	-	-	-	-	1
Iron Age II	29.750	29.500	30.000	0.354	0.125	2
<u>Bd</u>						
Iron Age I	34.500	33.000	36.000	2.121	4.500	2
Iron Age II	38.833	36.500	40.000	2.021	4.083	3

Measurements of Red Deer bones from Northton, Harris.

<u>1st phalange</u>	<u>mean</u>	<u>minimum</u>	<u>maximum</u>	<u>std.dev.</u>	<u>variance</u>	<u>no.</u>
<u>GLpe</u>						
Iron Age II	43.375	39.000	45.500	2.954	8.729	4
<u>Bp</u>						
Iron Age II	16.000	15.500	17.000	0.612	0.375	5
<u>SD</u>						
Iron Age II	12.500	11.500	13.000	0.707	0.500	5
<u>Bd</u>						
Iron Age II	15.100	14.500	16.000	0.548	0.300	5

Measurements of sheep bones from A'Cheardach Mhor.

	<u>mean</u>	<u>minimum</u>	<u>maximum</u>	<u>std.dev.</u>	<u>variance</u>	<u>no.</u>
<u>1st phalange</u>						
<u>GLpe</u>	30.500	29.500	31.500	0.645	0.417	7
<u>SD</u>	8.500	7.500	9.500	0.645	0.417	7
<u>Bp</u>	10.286	9.500	11.000	0.567	0.321	7
<u>Bd</u>	9.500	8.000	10.500	0.913	0.833	7

Humerus GLC 109.000 Bd 24.000 BT 23.500

	<u>mean</u>	<u>minimum</u>	<u>maximum</u>	<u>std.dev.</u>	<u>variance</u>	<u>no.</u>
<u>Radius</u>						
<u>G1</u>	136.500	130.500	142.000	5.766	33.250	3
<u>Bp</u>	26.500	25.500	27.000	0.866	0.750	3
<u>BFp</u>	24.667	24.000	25.000	0.577	0.333	3
<u>Bd</u>	24.500	24.000	25.000	0.500	0.250	3
<u>BFd</u>	20.500	20.500	20.500	0.000	0.000	3

Metacarpal

<u>G1</u>	112.143	108.000	116.500	3.092	9.560	7
<u>Bp</u>	19.500	19.000	20.000	0.548	0.300	6
<u>SD</u>	11.643	10.500	12.500	0.852	0.726	7
<u>Bd</u>	21.929	21.000	23.500	1.018	1.036	7

Tibia

<u>G1</u>	180.000	179.000	181.000	1.414	2.000	2
<u>Bp</u>	32.500	-	-	-	-	1
<u>SD</u>	12.250	11.500	13.000	1.061	1.125	2
<u>Bd</u>	21.000	21.000	21.000	0.000	0.000	2

	<u>mean</u>	<u>minimum</u>	<u>maximum</u>	<u>std.dev.</u>	<u>variance</u>	<u>no.</u>
<u>Metatarsal</u>						
<u>G1</u>	125.125	119.500	134.000	4.438	19.696	8
<u>SD</u>	10.437	9.500	11.000	0.623	0.388	8
<u>Bp</u>	17.500	16.500	18.500	0.655	0.429	8
<u>Bd</u>	20.071	19.000	21.000	0.673	0.452	7

Astragalus

<u>GL1</u>	24.125	23.000	26.000	1.315	1.729	4
<u>D1</u>	13.000	12.000	14.000	0.913	0.833	4
<u>GLm</u>	22.875	21.500	24.000	1.109	1.229	4
<u>Dm</u>	14.000	13.000	15.000	0.913	0.833	4
<u>Bd</u>	15.375	15.000	16.000	0.479	0.229	4

Measurements of cattle bones from A'Cheardach Mhor.

	<u>mean</u>	<u>minimum</u>	<u>maximum</u>	<u>std.dev.</u>	<u>variance</u>	<u>no.</u>
<u>1st phalange</u>						
<u>GLpe</u>	50.500	47.000	54.500	2.415	5.833	7
<u>Bp</u>	24.786	23.000	25.500	0.906	0.821	7
<u>SD</u>	21.357	20.500	22.500	0.627	0.393	7
<u>Bd</u>	23.143	21.000	25.000	1.314	1.726	7
<u>2nd phalange</u>						
<u>G1</u>	34.750	33.000	36.500	1.102	1.214	8
<u>Bp</u>	25.062	23.000	26.000	0.980	0.960	8
<u>SD</u>	19.625	18.000	21.000	0.876	0.768	8
<u>Bd</u>	21.100	20.500	22.000	0.652	0.425	5

	<u>mean</u>	<u>minimum</u>	<u>maximum</u>	<u>std.dev.</u>	<u>variance</u>	<u>no.</u>
<u>Astragalus</u>						
<u>GLl</u>	57.500	56.000	59.000	2.121	4.500	2
<u>Dl</u>	33.500	31.000	36.000	3.540	12.500	2
<u>GLm</u>	52.000	51.500	52.500	0.707	0.500	2
<u>Dm</u>	27.750	27.500	28.000	0.354	0.125	2
<u>Bd</u>	37.000	35.500	38.500	2.121	4.500	2
<u>3rd phalange</u>	<u>DLS</u>	64.5	<u>Ld</u>	50.5	<u>MBS</u>	21.0

Measurements of sheep bones from the Udal, North Uist.

<u>1st phalange</u>	<u>mean</u>	<u>minimum</u>	<u>maximum</u>	<u>std. dev.</u>	<u>variance</u>	<u>no.</u>
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GLpe

Neolithic	31.400	30.500	32.500	0.894	0.800	5
Early WH	31.056	28.500	32.500	1.379	1.903	9
Late WH/sq.	30.933	29.000	33.000	0.874	0.764	82

SD

Neolithic	7.900	7.000	8.500	0.548	0.300	5
Early WH	8.389	7.500	9.000	0.651	0.424	9
Late WH/sq.	8.220	7.000	9.500	0.573	0.328	82

Bp

Neolithic	10.600	10.000	11.000	0.418	0.175	5
Early WH	10.444	9.500	11.000	0.464	0.215	9
Late WH/sq.	10.377	9.500	11.500	0.451	0.203	81

Bd

Neolithic	9.400	8.500	10.000	0.548	0.300	5
Early WH	9.667	9.000	11.000	0.661	0.437	9
Late WH/sq.	9.679	8.500	11.000	0.634	0.402	81

2nd phalange

G1

Neolithic	19.038	18.000	21.000	1.030	1.061	13
EBA	20.000	-	-	-	-	1
pre-WH	18.500	18.500	18.500	0.000	0.000	2
Early WH	18.167	17.500	19.000	0.500	0.250	9
Late WH/sq.	18.623	16.000	20.500	0.863	0.746	69

	<u>mean</u>	<u>minimum</u>	<u>maximum</u>	<u>std. dev.</u>	<u>variance</u>	<u>no.</u>
<u>SD</u>						
Neolithic	7.385	6.000	8.000	0.618	0.381	13
EBA	7.000	-	-	-	-	1
pre-WH	6.500	6.000	7.000	0.707	0.500	2
Early WH	7.222	6.000	8.000	0.712	0.507	9
Late WH/sq.	7.217	6.000	8.500	0.678	0.459	69
<u>Bp</u>						
Neolithic	9.923	8.500	11.000	0.672	0.452	13
EBA	10.000	-	-	-	-	1
pre-WH	8.750	8.000	9.500	1.061	1.125	2
Early WH	9.889	9.000	11.000	0.697	0.486	9
Late WH/sq.	9.819	8.000	11.000	0.762	0.581	69
<u>Bd</u>						
Neolithic	8.182	8.000	9.000	0.337	0.114	11
EBA	8.000	-	-	-	-	1
pre-WH	7.500	7.000	8.000	0.707	0.500	2
Early WH	8.071	7.000	9.000	0.673	0.452	7
Late WH/sq.	8.038	6.500	9.500	0.577	0.333	66
<u>Scapula</u>						
<u>GLP</u>						
pre-WH	30.000	-	-	-	-	1
Early WH	28.000	-	-	-	-	1
Late WH/sq.	27.395	25.500	29.000	1.185	1.405	19
<u>HS</u>						
Late WH/sq.	122.125	115.000	131.000	6.688	44.729	4
<u>DHA</u>						
Late WH/sq.	126.100	113.000	138.000	9.072	82.300	5

	<u>mean</u>	<u>minimum</u>	<u>maximum</u>	<u>std. dev.</u>	<u>variance</u>	<u>no.</u>
<u>LD</u>						
Late WH/sq.	76.000	74.500	77.500	2.121	4.500	2
<u>LG</u>						
pre-WH	24.000	-	-	-	-	1
Early WH	23.000	-	-	-	-	1
Late WH/sq.	22.211	20.500	24.000	1.217	1.481	19
<u>BG</u>						
pre-WH	20.500	-	-	-	-	1
Early WH	17.500	-	-	-	-	1
Late WH/sq.	16.937	15.500	19.000	0.911	0.829	16
<u>Humerus</u>						
<u>G1</u>						
Late WH/sq.	125.667	123.000	128.500	2.754	7.583	3
<u>G1c</u>						
Late WH/sq.	113.500	111.000	116.500	2.784	7.750	3
<u>SD</u>						
Late WH/sq.	12.167	12.000	12.500	0.289	0.083	3
<u>Bd</u>						
Late WH/sq.	26.500	25.500	27.000	0.866	0.750	3
<u>BT</u>						
Late WH/sq.	25.500	25.000	26.000	0.500	0.250	3
<u>Bp</u>						
Late WH/sq.	34.250	34.000	34.500	0.354	0.125	2

	<u>mean</u>	<u>minimum</u>	<u>maximum</u>	<u>std.dev.</u>	<u>variance</u>	<u>no.</u>
<u>Radius</u>						
<u>G1</u>						
Late WH/sq.	137.900	130.000	152.000	6.839	46.767	10
<u>Bp</u>						
Neolithic	30.000	-	-	-	-	1
Late WH/sq.	27.273	25.500	29.000	1.081	1.168	11
<u>BFp</u>						
Neolithic	27.000	-	-	-	-	1
Late WH/sq.	25.227	24.000	27.000	0.598	0.918	11
<u>Bd</u>						
Neolithic	25.667	25.000	26.500	0.764	0.583	3
Late WH/sq.	24.773	23.500	27.000	1.170	1.368	11
<u>BFd</u>						
Neolithic	21.333	21.000	21.500	0.289	0.083	3
Late WH/sq.	21.000	19.500	23.500	1.285	1.650	11
<u>Ulna</u>						
<u>LO</u>						
Early WH	37.500	36.000	39.000	2.121	4.500	2
Late WH/sq.	34.833	33.000	37.000	1.677	2.812	9
<u>DPA</u>						
Early WH	23.500	23.000	24.000	0.707	0.500	2
Late WH/sq.	22.889	22.000	24.000	0.928	0.861	9
<u>SDO</u>						
Neolithic	19.500	-	-	-	-	1
Early WH	19.750	18.500	21.000	1.768	3.125	2
Late WH/sq.	19.187	18.000	20.000	0.843	0.710	8

	<u>mean</u>	<u>minimum</u>	<u>maximum</u>	<u>std.dev.</u>	<u>variation</u>	<u>no.</u>
<u>BPC</u>						
Neolithic	18.500	-	-	-	-	1
Early WH	14.500	14.000	15.000	0.707	0.500	2
Late WH/sq.	15.611	14.500	17.000	0.894	0.799	9

Metacarpal

G1

Late WH/sq.	114.400	109.500	120.000	3.089	9.544	10
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SD

Late WH/sq.	11.150	10.500	12.000	0.412	0.169	10
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Bp

Late WH/sq.	19.300	18.500	20.000	0.675	0.456	10
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Bd

Late WH/sq.	21.700	21.000	22.500	0.483	0.233	10
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Femur

Late WH/sq.	<u>G1</u> 150.500	<u>GLC</u> 147.500	<u>Bp</u> 37.500	<u>DC</u> 13.500
	<u>SD</u> 12.000	<u>Bd</u> 3.100		

	<u>mean</u>	<u>minimum</u>	<u>maximum</u>	<u>std.dev.</u>	<u>variance</u>	<u>no.</u>
<u>Tibia</u>						

G1

Late WH/sq.	182.000	-	-	-	-	1
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Bp

Late WH/sq.	35.500	34.500	36.500	1.414	2.000	2
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SD

Late WH/sq.	11.333	11.000	12.000	0.577	0.333	3
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Bd

Late WH/sq.	22.833	22.500	23.000	0.289	0.083	3
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	<u>mean</u>	<u>minimum</u>	<u>maximum</u>	<u>std.dev.</u>	<u>variance</u>	<u>no.</u>
<u>Metatarsal</u>						
<u>G1</u>						
Late WH/sq.	125.625	121.000	129.000	2.664	7.097	12
<u>SD</u>						
Late WH/sq.	9.833	9.000	10.500	0.450	0.202	15
<u>Bp</u>						
Late WH/sq.	17.536	17.000	18.500	0.536	0.287	14
<u>Bd</u>						
Late WH/sq.	20.400	19.500	21.000	0.431	0.186	15
<u>Calcaneum</u>						
<u>G1</u>						
EBA	53.500	-	-	-	-	1
Early WH	48.750	46.000	51.500	3.889	15.125	2
Late WH/sq.	49.933	47.000	53.000	1.981	3.924	15
<u>GB</u>						
EBA	18.500	-	-	-	-	1
Early WH	15.750	14.500	17.000	1.768	3.125	2
Late WH/sq.	17.567	16.000	19.000	0.923	0.852	15
<u>Astragalus</u>						
<u>GL1</u>						
Neolithic	25.000	23.000	27.000	1.414	2.000	9
Beaker	27.250	27.000	27.500	0.354	0.125	2
pre-WH	25.333	23.000	26.500	2.021	4.083	3
Early WH	24.417	23.000	26.000	1.281	1.642	6
Late WH/sq.	24.514	22.000	28.000	1.346	1.812	37

	<u>mean</u>	<u>minimum</u>	<u>maximum</u>	<u>std.dev.</u>	<u>variance</u>	<u>no.</u>
<u>D1</u>						
Neolithic	14.100	13.000	15.000	0.894	0.800	5
Beaker	15.000	-	-	-	-	1
pre-WH	14.000	13.000	14.500	0.866	0.750	3
Early WH	13.583	12.000	15.000	1.021	1.042	6
Late WH/sq.	13.703	12.500	15.000	0.768	0.590	37
<u>GLm</u>						
Neolithic	24.222	22.500	26.000	1.202	1.444	9
Beaker	26.000	25.000	27.000	1.414	2.000	2
pre-WH	24.500	22.500	25.500	1.732	3.000	3
Early WH	23.857	22.500	25.000	1.180	1.393	7
Late WH/sq.	23.583	21.000	26.500	1.317	1.736	36
<u>Dm</u>						
Neolithic	15.500	15.000	16.000	0.707	0.500	2
pre-WH	15.000	13.500	16.000	1.323	1.750	3
Early WH	14.000	13.000	16.000	1.414	2.000	5
Late WH/sq.	14.567	13.500	16.500	0.848	0.720	30
<u>Bd</u>						
Neolithic	16.500	15.000	18.500	1.250	1.562	9
Beaker	17.000	-	-	-	-	1
pre-WH	15.833	15.000	16.500	0.764	0.583	3
Early WH	15.800	14.500	18.000	1.351	1.825	5
Late WH/sq.	16.095	14.500	18.000	0.665	0.442	37

Measurements of cattle bones from the Udal, North Uist.

	<u>mean</u>	<u>minimum</u>	<u>maximum</u>	<u>std.dev.</u>	<u>variance</u>	<u>no.</u>
<u>1st phalange</u>						
<u>GLpe</u>						
Early WH	52.750	52.000	53.500	1.061	1.125	2
Late WH/sq.	49.167	49.000	49.500	0.289	0.083	3
<u>Bp</u>						
Early WH	25.000	25.000	25.000	0.000	0.000	2
Late WH/sq.	26.333	25.000	22.500	0.289	0.083	3
<u>SD</u>						
Early WH	21.000	21.000	21.000	0.000	0.000	2
Late WH/sq.	22.333	22.000	22.500	0.289	0.083	3
<u>Bd</u>						
Early WH	23.000	22.500	23.500	0.707	0.500	2
Late WH/sq.	23.833	23.500	24.000	0.289	0.083	3
<u>2nd phalange</u>						
<u>G1</u>						
Pre-WH	37.500	37.000	38.000	0.707	0.500	2
Early WH	33.500	32.000	35.500	1.803	3.250	3
Late WH/sq.	33.611	32.500	34.500	0.928	0.861	9
<u>Bp</u>						
Pre-WH	27.000	26.000	28.000	1.414	2.000	2
Early WH	25.500	25.000	26.500	0.500	0.250	3
Late WH/sq.	25.167	23.000	27.000	1.225	1.500	9
<u>SD</u>						
Pre-WH	20.750	19.500	22.000	1.768	3.125	2
Early WH	19.667	19.000	20.000	0.577	0.333	3
Late WH/sq.	19.667	18.000	20.500	0.866	0.750	9

	<u>mean</u>	<u>minimum</u>	<u>maximum</u>	<u>std.dev.</u>	<u>variance</u>	<u>no.</u>
<u>Bd</u>						
Pre-WH	21.750	20.000	23.500	2.475	6.125	2
Early WH	20.833	20.500	21.500	0.577	0.333	3
Late WH/sq.	21.055	18.500	22.000	1.184	1.403	9

Appendix 3.

Identification of faunal remains from:

Sollas, North Uist

Northton, Harris

A'Cheardach Mhor, South Uist

A'Cheardach Bheag, South Uist

Various sites in South Uist and Benbecula

Abbreviations.

R. right

L. left

frag. fragment

(p.f.) proximal epiphysis fused

(p.u.) proximal epiphysis unfused

(d.f.) distal epiphysis fused

(d.u.) distal epiphysis unfused

/ broken edge of tooth row

- tooth missing from tooth row

nid. not identifiable

Identification of the faunal remains from Sollas, North Uist.

WB Cell C

C/1 top layer above floor

Sheep

R. metacarpal proximal (p.f.)

Cattle

8 loose teeth

L. radius distal frag. (d.f.)

L. astragalus

R. mandible frag. p2p3p4/

R. mandible frag. /M3 (erupting)

L. mandible frag. /p/

L. maxilla frag. /M1M2

R. maxilla frag. /p-M/

R. maxilla frag. /M/

Pig

loose tooth

R. maxilla frag. -P2P3P4M1/

Fish

L. premaxilla of Cod Gadus morhua P = 118mm - cf. 4Kg. weight, 75cm length.
(Identified by S. Colley, Faunal Remains Project, Southampton)

Nid including ribs and shaft frags.

C/2 below floor

Only unidentifiable frags. including shaft frags., burnt and unburnt bone.

C/3 south of Cell C

Cattle

2 x loose teeth

L. calcaneum frag.

tarsal

L. metacarpal proximal frag.

Pig

R. metatarsal IV proximal frag.

Bird

ulna distal - medium gull cf. Larus argentatus (Herring Gull)

Nid including shaft frags, burnt and unburnt bone

Cell 1.

Pit 1 1/11

Cattle

3 x sesamoids
9 x carpals/tarsals
8 x 1st phalange (p.u.) (some burnt)
8 x 2nd phalange (p.u.) (some burnt)
6 x 3rd phalange (p.f.)
L. metacarpal proximal frag. (p.f.)
L. metacarpal (d.u.)
5 x metapodial proximal frags. (p.f.)
4 x metapodial distal epiphyses (d.u.)
3 x metapodial shaft frags.
2 x metapodial distal (d.u.)

Nid including ribs and shaft frags.

Pit 2 1/12

Nid including ribs and vertebrae

Pit 3 1/14

Cattle

loose tooth

Bird

3 bones of Alca impennis (Great Auk)

Nid including vertebrae and shaft frags.

Pit 4 1/13

Nid ribs

Floor 2 1/9

Sheep

L. maxilla frag. p2p3p4/

Cattle

2 x loose teeth

Nid including ribs and vertebrae

In and below Floor 1 1/6

Cattle

loose tooth

L. metacarpal proximal frag. (p.f.)

2nd phalange (p.u.)

Pig

3rd phalange (p.f.)

Nid including ribs and vertebrae

Floor 1 1/4 + 1/3

Sheep

R. astragalus

R. innominate frag. (ilium)

L. femur distal (d.u.)

Nid frag.

Cell 2.

Pit 2/12 + 2/6

Sheep

loose tooth

Nid including ribs and shaft frags.

Floor 3 2/9 + 2/10

Nid frags.

Floor 2 2/8

Sheep

L. femur proximal (p.f.)

metapodial distal epiphysis frag. (d.u.)

Cattle

loose tooth

patella

Nid including ribs and shaft frags.

Floor 1 2/5

Sheep

L. femur proximal (p.f.)
R. mandible frag. p2p3p4/

Cattle

lateral malleolus

Whale

earbone of Tursio acutus (Bottle-nosed Dolphin)

Nid including ribs and vertebrae

Cell 4

Pit 4/24

Cattle

loose tooth	(burnt)
lateral malleolus	(")
4 x carpals/tarsals	(")
4 x sesamoids	(")
R. metacarpal proximal frag. (p.f.)	(")
L. metacarpal proximal frag. (p.f.)	(")
metapodial distal epiphysis frag. (d.u.)	(")
1st phalange (p.f.)	(")
2 x 1st phalange proximal (p.f.)	(")
2nd phalange (p.f.)	(")
3rd phalange frag.	(")
astragalus frag.	(")
R. radius proximal frag. (p.f.)	(")
L. tibia distal (d.f.)	(")

Nid burnt bone

Bottom of pit in Floor 5 4/9

Cattle

loose tooth	(burnt)
2 x horn-core frags.	(")
metapodial distal (d.f.)	(")
2 x atlas frags.	(")
L. ulna frag.	(")
L. radius proximal frag. (p.f.)	(")
carpal/tarsal	(")
4 x 3rd phalange frags.	(")
2nd phalange frag.	(")
2 x 1st phalange frags.	(")

Nid much burnt bone

Dirty sand below Floor 5 4/21

Fish

maxilla of Pollachius virens (Saithe) cf. 1.4 Kg. fish (Id. by S. Colley, Faunal Remains Project, Southampton)

Floor 5 4/20

Nid including ribs and vertebrae

Secondary peat layer 4/23

Cattle

metatarsal proximal frag. (burnt)

Nid burnt bone

Peat layer and sand over Floor 5 4/19 + 4/18

Pig

3rd phalange (p.u.)

Fish

Nid frag.

Floor 4 and sand over peat layer 4/17 + 4/16

Sheep

L. radius (p.u., d.u.)

R. femur distal frag.

Fish

ceratahyoid of Pollachius virens (Saithe) cf. 1.4 Kg. fish (Id. by S. Colley, Faunal Remains Project, Southampton)

Bird

tibiatarus - medium gull cf. Larus argentatus (Herring Gull)

ulna - Motacilla yarrellii (Pied Wagtail)

Nid including ribs and shaft frags.

Floor 4 4/8

Cattle

loose tooth

Nid including ribs and vertebrae

Sand between Floors 3 and 4 4/15

Cattle
loose tooth

Floor 3 4/6

Cattle
loose tooth

Fish
dentary and preoperculum of Pollachius virens (Saithe) cf. 1.4 Kg fish
(Id. by S. Colley, Faunal Remains Project, Southampton)

Nid including ribs and vertebrae

Sand between Floors 2 and 3 4/13

Sheep
tarsal

Cattle
loose tooth
L. femur distal (d.f.)
R. tibia (p.u.,d.u.)
astragalus frag.
L. ulna frag.
1st phalange (p.f.)
L. mandible frag. p2p3p4/
L. metacarpal (p.f.,d.u.)

Pig
3rd phalange (p.f.)
Metatarsal II (p.f.,d.u.)

Bird
humerus - Puffinus puffinus (Manx Shearwater)

Nid including ribs and shaft frags.

Floor 2 4/4 + 4/11

Cattle
7 x loose teeth
scapula frag.
L. maxilla frag.
R. innominate frag. (ischium)
R. mandible frag. /P3p4M1M2M3 (P3 and M3 erupting)
L. mandible frag. p2p3p4/
tarsal

Pig
loose tooth

Bird
beak frag. - Alca impennis (Great Auk)
ulna distal - Sula bassana (Gannet)

Nid including ribs, vertebrae and shaft frags.

Cell 5.

Pit 1 5/28 + 5/14

Sheep
2nd phalange (p.u.)

Cattle
loose tooth

Nid including vertebrae and shaft frags.

Pit 2 5/15 + 5/19 + 5/21

Sheep
atlas frag.
axis frag.
metatarsal (p.f.,d.u.)
metapodial distal epiphysis frag. (d.u.)
carpal
carpal (burnt)
patella (")
R. metatarsal proximal (p.f.) (")
metatarsal distal (d.f.) (")
L. radius distal (d.f.) (")
L. humerus distal frag. (d.f.) (")
2 x metapodial distal epiphysis (d.u.) (")
L. metacarpal proximal frag. (p.f.) (")
R. scapula frag. (")
1st phalange (p.f.) (")
L. calcaneum frag. (")

Cattle
atlas
axis
R. calcaneum (d.u.)
L. calcaneum (d.u.)
patella
L. astragalus
R. astragalus
lateral malleolus
3 x carpals/tarsals

sesamoid

L. ulna (p.u.)
R. ulna (p.u.)
L. humerus shaft frag.
L. innominate frag. (ilium)
L. innominate frag. (ischium)
L. innominate frag. (pubis)
R. tibia distal (d.u.)
L. tibia distal (d.u.)
R. radius distal (d.u.)
L. radius distal epiphysis (d.u.)
R. tibia proximal (p.u.)
L. tibia proximal epiphysis (p.u.)
L. radius proximal (p.f.)
R. radius proximal frag. (p.f.)
L. femur proximal (p.u.)
R. femur proximal (p.u.)
L. humerus proximal (p.u.)
R. humerus proximal (p.u.)
L. humerus distal (d.fusing)
R. humerus distal (d.fusing)
R. innominate frag. (ischium)
R. innominate frag. (ilium)
1st phalange (p.f.)

Deer

L. scapula frag.
metatarsal shaft frag.

Nid including ribs, vertebrae and shaft frags., burnt and unburnt

Pit under Floor 5 5/12

Sheep

atlas frag. (burnt)
metatarsal shaft frag.

Nid including ribs and vertebrae, burnt and unburnt bone

Pit 4 5/17

Sheep

loose tooth
atlas
axis
sacral vertebra
patella
L. calcaneum distal epiphysis (d.u.)
R. calcaneum distal epiphysis (d.u.)
4 x metapodial distal epiphysis (d.u.)
L. humerus proximal epiphysis (p.u.)
R. humerus proximal epiphysis (p.u.)
2 x lateral malleoli

2 x sesamoids
8 x 1st phalange (p.u.)
8 x 2nd phalange (p.u.)
7 x 3rd phalange (p.f.)
12 x carpals/tarsals
L. maxilla frag. /p3/
L. femur proximal epiphysis (p.u.)
R. femur proximal epiphysis (p.u.)

Nid including ribs and vertebrae

Pit 5 5/16

Cattle
loose tooth

Nid including ribs and vertebrae

Floor 5 5/10

Nid including ribs and shaft frags., burnt and unburnt bone

Floor 4 5/25

Nid including shaft frag.

Floor 3 5/26 + 5/27 + 5/8

Sheep
3 x loose teeth
carpal
R. ulna frag.
L. radius shaft frag.
L. femur (p.u., d.u.)
metatarsal shaft frag.

Cattle
2 x loose teeth
1st phalange (p.f.)
metapodial distal epiphysis frag. (d.f.)
R. ulna frag.
L. radius proximal frag. (p.f.)
R. radius distal frag. (d.u.)
L. mandible frag. p2p3/

Pig
L. radius shaft frag.
L. mandible frag. /CDm1/

Bird

ulna distal - goose cf. Anser anser (Grey Goose)
femur - Sturnus vulgaris (Starling)
tibiotarsus frag. - Alca impennis (Great Auk)
2 x nid frags.

Nid including ribs, vertebrae and shaft frags.

Floor 2 5/7 + 5/6

Pig

L. scapula
mandible frag. /M/

Fish

dentary of Gadus morhua (Cod) D = 9.8mm cf. 6kg weight, 88cm length
dentary, branchial, precaudal vertebra of Cod/Saithe
Nid frag.

(All id. by S. Colley, Faunal Remains Project, Southampton)

Nid including shaft frags.

Floor 1 5/22 + 5/4

Sheep

tarsal
radius shaft frag.

Cattle

carpal
R. calcaneum frag.
L. innominate frag. (ischium)

Pig

R. scapula
3rd phalange

Bird

2 bones of medium gull cf. Larus argentatus (Herring Gull)

Nid including ribs and vertebrae

Cell 6

Pit 3 6/26

Sheep

sacral vertebra

Nid including ribs and vertebrae

Below Floor 4 6/14 + 6/15 + 6/27

Sheep

R. metatarsal (p.f.,d.f.)
2 x 1st phalange (p.f.)
2nd phalange (p.f.)
2 x 3rd phalange (p.f.)

Nid including ribs and vertebra frags.

Floor 4 6/12 + 6/22

Sheep

patella
L. metatarsal (p.f.,d.f.)

Cattle

loose tooth
carpal
R. ulna frag.

Nid including ribs and vertebrae

Floor 3 6/8 + 6/25 + 6/13

Sheep

loose tooth

Cattle

9 x loose teeth
L. scapula frag.
R. scapula frag.
L. metacarpal proximal frag. (p.f.)
L. humerus proximal (p.u.)
metapodial distal epiphysis frag. (d.u.)
metapodial shaft frag.
astragalus frag.
3rd phalange (p.f.)
L. innominate frag. (ischium)
R. innominate frag. (ischium)
L. mandible p2p3p4M1 (M1 erupting)
R. mandible frag. p2p3p4/
L. maxilla frag. /p4M1

Bird

ulna - Passer domesticus (Sparrow)
Nid frag.

Nid including ribs,vertebrae and shaft frags.

Floor 2 6/10 + 6/19 + 6/6

Sheep

loose tooth

R. mandible frag. p2p3p4M1/

Cattle

2 x loose teeth

L. radius (p.u.,d.u.)

sesamoid

Pig

3rd phalange (p.f.)

Bird

Tarsometatarsal - cf. Lyrurus tectrix (Black Grouse)

4 bones of Motacilla yarrellii (Pied Wagtail)

Nid frag.

Nid including ribs,vertebrae and shaft frags.,burnt and unburnt bone

Floor 1 6/4 + 6/17 +6/3

Sheep

lamb cranial frags. (neo-natal)

1st phalange (p.u.,d.u.) (neo-natal)

Cattle

3 x carpals

Pig

2 x loose teeth

Nid including ribs and shaft frags.

Cell 7

Pit 1 7/9 + 7/10

Sheep

R. calcaneum (d.u.)

R. astragalus

R. tibia distal epiphysis (d.u.)

R. lateral malleolus

R. ulna frag. (burnt) (slightly malformed)

Pig

L. metacarpal II (p.f.,d.u.)

Nid including vertebrae and shaft frags.

Pit 2 7/12 + 7/27 + 7/13

Sheep

3 x loose teeth
L. ulna proximal (p.f.) (burnt)
R. astragalus (")
metatarsal shaft frag. (")
carpal
L. radius distal epiphysis (d.u.)
R. tibia proximal epiphysis (p.u.)
R. humerus proximal epiphysis (p.u.)
L. radius distal epiphysis (d.u.)
R. scapula proximal proximal frag. (p.u.) (burnt)
metatarsal shaft frag.
2 carpals/tarsals

Cattle

2 x loose teeth
1st phalange proximal (p.f.) (burnt)

Pig

R. astragalus frag. (burnt)
metapodial distal epiphysis (d.u.) (")
3rd phalange (p.f.) (")
2nd phalange (p.u.) (")
1st phalange (p.u.) (")
L. humerus dist. (d.u.) (")
R. scapula frag. (")
2 x metapodial distal (d.u.) (")
2nd phalange (p.u.) (")
3rd phalange frag. (")
2nd phalange frag. (")
2 x carpals/tarsals (")
3rd phalange (p.f.)

Deer

calcaneum distal epiphysis (d.u.)

Dog

mandible frag. (burnt)

Fish

Nid frag.

Nid including ribs and shaft frags., burnt and unburnt bone

Pit 3 7/13A + 7/30

Cattle

axis frag. (burnt)
L. mandible frag. (")
L. tibia proximal (p.f.) (")

R. tibia proximal (p.f.)	(")
R. tibia distal (d.f.)	(")
L. femur proximal frag. (p.f.)	(")
R. femur proximal frag. (p.f.)	(")
L. radius distal epiphysis (d.u.)	(")
R. radius proximal (p.f.)	(")
R. ulna frag.	(")
L. scapula frag.	(")
R. humerus distal frag. (d.f.)	(")
R. calcaneum (d.f.)	(")
L. calcaneum frag.	(")
2 x metapodial distal frag. (d.f.)	(")
metatarsal shaft frag.	(")
patella	(")
2 x sesamoids	(")
tarsal	(")
1st phalange (p.f.)	(")
5 x 2nd phalange (p.f.)	(")
3rd phalange frag.	(")

Nid burnt bone

Pit 4 7/24

Sheep

loose tooth

L. tibia proximal epiphysis (p.u.)
 L. femur proximal epiphysis (p.u.)
 R. femur proximal epiphysis (p.u.)
 2nd phalange (p.f.)

Nid including burnt and unburnt bone

2 pits by fallen pier 7/25

Sheep

metapodial distal epiphysis (d.u.)

Cattle

L. femur (p.u.,d.u.)
 R. femur (p.u.,d.u.)
 L. humerus distal (d.u.)
 R. humerus proximal (p.u.)
 L. scapula (p.f.)
 R. scapula (p.f.)
 metatarsal distal (d.u.)
 L. metacarpal (p.f.,d.u.)
 R. metacarpal (p.f.,d.u.)
 4 x 1st phalange (p.u.)
 4 x 2nd phalange (p.u.)
 L. tibia (p.u.,d.u.)
 R. tibia (p.u.,d.u.)
 L. radius (p.u.,d.u.)

R. radius (p.u.,d.u.)
L. ulna (p.u.)
R. ulna (p.u.)
L. astragalus
R. astragalus
L. calcaneum (d.u.)
L. innominate frag. (ilium/ischium)
R. innominate frag. (ilium/ischium)

Nid including ribs and shaft frags.

Pit 7 7/15 + 7/22

Sheep

L. mandible p2p3p4M1
R. mandible p2p3p4M1
L. maxilla p2p3p4M1
R. maxilla p2p3p4M1
9 x carpals/tarsals
patella
L. calcaneum (d.u.)
L. astragalus (Cut mark 2)
5 x 2nd phalange
axis (caudal unfused)
vertebrae and rib frags.
R. tibia proximal (p.u.)
L. scapula (p.f.)
R. humerus proximal (p.u.)
L. femur distal (d.u.)
R. radius proximal (p.f.)
L. metatarsal (p.f.,d.u.)
R. tibia distal (d.u.)
L. tibia distal epiphysis (d.u.)
skull frags. (with slight charring)

Cattle

L. mandible frag. p2p3p4/
R. mandible frag. p2p3/
15 x loose teeth
L. femur (p.u.,d.u.)
R. femur (p.u.,d.u.)
L. humerus (p.u.,d.u.)
R. humerus (p.u.,d.u.)
R. tibia (p.u.,d.u.)
L. calcaneum (d.u.)
R. calcaneum (d.u.)
R. astragalus
L. scapula (p.f.)
R. scapula (p.f.)
L. radius (p.u.,d.u.)
R. radius (p.u.,d.u.)
L. ulna (p.u.)
R. ulna (p.u.)
L. metatarsal (p.f.,d.u.)

R. metatarsal (p.f.,d.u.)
 L. metacarpal (p.f.,d.u.)
 R. metacarpal (p.f.,d.u.)
 5 x 1st phalange (p.u.)
 4 x 2nd phalange (p.u.)
 5 x 3rd phalange (p.f.)
 L. innominate frag. (ilium/ischium)
 R. innominate frag. (ilium/ischium)

Nid including ribs and vertebrae

Pit 15 7/33

Sheep

L. radius (p.f.,d.u.)
 L. humerus (p.u.,d.f.)

Nid including ribs and shaft frags.,burnt and unburnt bone

Pocket below Floor 2 7/11

Sheep

L. calcaneum frag. (d.f.)	(burnt)
L. femur proximal frag. (p.f.)	(")
R. radius proximal (p.f.)	(")
L. radius distal epiphysis (d.u.)	(")
1st phalange proximal (p.f.)	(")
2nd phalange (p.f.)	(")

Nid including shaft frags.

Floor 2 7/6 + 7/21 + 7/7

Sheep

5 x loose teeth
 atlas
 axis
 R. femur (p.u.,d.u.) (Cut marks under caput at neck)
 L. humerus (p.u.,d.f.)
 R. radius distal epiphysis (d.u.)
 8 x carpals/tarsals
 L. astragalus
 metapodial distal epiphysis (d.u.)
 2 x 1st phalange (p.u.)
 2nd phalange (p.u.)
 L. innominate frag. (pubis)
 R. maxilla p2p3p4M1
 L. maxilla frag. /p3p4M1
 R. mandible p2p3p4M1
 L. mandible p2p3p4M1

Deer

1st phalange (p.f.)
2nd phalange (p.f.)
3rd phalange (p.f.)

Bird

humerus proximal - Fratercula arctica (Puffin)

Nid including vertebrae and shaft frags.

Sand above Floor 2 7/4 + 7/18

Sheep

R. mandible p2p3p4M1 (M1 erupting)
femur proximal epiphysis (p.u.)
R. horn-core/skull frag.

Cattle

2nd phalange (p.f.)

Nid including shaft frags., ribs and vertebrae

Floor 1 7/2 + 7/16

Nid frags.

Unstratified 7/29

Sheep

L. mandible frag.	p2p3p4M1/
R. maxilla frag.	p2p3p4M1/
L. maxilla frag.	p2p3p4M1/

Cattle

loose tooth

L. mandible	p2p3p4M1	(M1 erupting)
R. mandible	p2p3p4M1	(M1 erupting)
R. calcaneum (d.u.)		
R. metacarpal (p.f., d.u.)		
L. maxilla frag.	p2p3p4/	
R. maxilla frag.	p2p3p4/	
R. humerus (p.u., d.u.)		
2 x 1st phalange (p.u.)	(1 burnt)	
2 x 3rd phalange (p.f.)		

Nid including ribs and vertebrae

Cell 8

Pit 1 8/7

Sheep
carpal

Cattle
2nd phalange (p.f.)

Nid burnt and unburnt bone

Pit 2 8/13

Nid frags.

Pit 4 8/12

Nid ribs and vertebrae

Pit 5 8/16 + 8/19 + 8/15

Sheep
L. astragalus
2nd phalange (p.u.)

<u>Cattle</u>	
loose tooth	(burnt)
7 x sesamoids	(")
2 x lateral malleoli	(")
R. ulna frag.	(")
R. radius distal epiphysis frag. (d.u.)	(")
2 x L. radius proximal frag. (p.f.)	(")
patella	(")
8 x carpals/tarsals	(")
1st phalange proximal (p.f.)	(")
4 x 1st phalange distal	(")
3 x 2nd phalanges (p.f.)	(")
2 x 2nd phalange distal frags.	(")
4 x 3rd phalanges (p.f.)	(")
L. metacarpal proximal (p.f.)	(")
R. metacarpal proximal frag. (p.f.)	(")

Nid burnt and unburnt bone

Pit 6 8/18

<u>Cattle</u>	
scapula frag.	(burnt)
L. tibia proximal frag. (p.f.)	(")

L. tibia distal frag. (d.f.)	(")
L. calcaneum frag.	(")
metapodial distal epiphysis frag.(d.u.)	(")
1st phalange (p.f.)	(")
2nd phalange (p.f.)	(")
3rd phalange (p.f.)	(")
2 x carpals	(")

Pig

L. humerus distal frag. (d.u.) (burnt)

Nid burnt bone

Pit 7 8/17

Cattle

1st phalange (p.u.)
 carpal (burnt)
 R. radius proximal frag. (p.f.) (")

Nid burnt and unburnt bone

Pit 9 8/23

Fish

2 x interoperculars from Gadus morhua (Cod) of c.6kg
 Nid frag.
 (All id. by S. Colley, Faunal Remains Project, Southampton)

Shallow pit below floor 1 (A) 8/6

Sheep

metapodial distal epiphysis (d.u.)
 2 x 1st phalanges (p.f.)
 2nd phalange (p.f.)

Nid ribs

Below floor 8/10

Sheep

3rd phalange (p.f.)

Cattle

3rd phalange
 sesamoid (burnt)
 metapodial distal epiphysis frag. (p.u.) (")

Fish

preoperculum of Gadus morhua (Cod) of c. 6kg.
 (Id. by S. Colley, Faunal Remains Project, Southampton)

Nid including ribs and shaft frags.

Floor 1 8/3+8/8

Sheep

vertebra frag. (split longitudinally along centrum)
carpal

Cattle

loose tooth

Nid including burnt and unburnt frags.

Contaminated bags from below floor 1 and pit 2 8/5/14/21

Cattle

2 x loose teeth	
L. tibia proximal frag. (p.u.)	(burnt)
humerus proximal frag. (p.u.)	(")
L. radius distal epiphysis frag. (d.u.)	(")
metatarsal shaft frag.	(")
2 x carpals/tarsals	(")
2 x 2nd phalange frag (p.f.)	(")
R. astragalus frag.	(")

Nid burnt bone

CELL 9

Pit 1 9/7

Sheep

atlas

axis

sacrum

L. scapula (p.f.)

R. scapula (p.f.)

L. femur (p.u.,d.u.)

R. femur (p.u.,d.u.)

L. humerus (p.u.,d.f.)

L. tibia (p.u.,d.f.)

R. tibia (p.u.,d.f.)

L. astragalus

R. astragalus

L. innominate

R. innominate

L. radius (p.f,d.u.)

R. radius (p.f.,d.u.)

L. ulna (p.u.)

R. ulna (p.u.)
 patella
 2 x lateral malleoli
 2 x sesamoids
 3 x carpal/tarsal
 L. calcaneum (d.u.)
 R. calcaneum (d.u.)

Nid including ribs and vertebrae

Pit 2 9/9

Sheep

R. radius distal epiphysis (d.u.)

Pig

R. humerus distal epiphysis (d.u.)	(burnt)
R. calcaneum frag. (d.u.)	(")
R. astragalus frag.	(")
L. astragalus frag.	(")
R. radius (p.u.,d.u.)	(")
R. tibia distal frag. (d.u.)	(")
R. metacarpal III (p.f.,d.u.)	(")
metapodial distal (d.u.)	(")
R. metatarsal III proximal (p.f.)	(")
10 x loose teeth	(")
R. ulna frag. (p.u.)	(")
R. mandible frags.	(")
R. scapula frags.	(")
R. femur distal epiphysis (d.u.)	(")
R. ulna shaft frag.	(")
4 x 1st phalanges (p.u.)	(")
2nd phalange (p.u.)	(")
R. metacarpal IV proximal (p.f.)	(")
3 x metapodial frags.	(")

Nid burnt bone

Pit 3 9/10+9/26

Cattle

12 x loose teeth		(neo-natal)
L. mandible frag.	/p3p4/	(")
L. ulna (p.u.)		(")
R. ulna (p.u.)		(")
R. tibia (p.u.,d.u.)		(")
L. tibia proximal epiphysis (p.u.)		(")
L. radius (p.u.,d.u.)		(")
R. radius (p.u.,d.u.)		(")
5 x 1st phalange (p.u.)		(")
4 x 2nd phalange (p.u.)		(")
4 x 3rd phalange		(")
L. scapula (p.u.)		(")

R. scapula (p.u.)	(")
R. femur (p.u.,d.u.)	(")
L. femur (p.u.,d.u.)	(")
L. humerus (p.u.,d.u.)	(")
R. humerus (p.u.,d.u.)	(")
L. astragalus	(")
R. astragalus	(")
R. calcaneum (d.u.)	(")
L. innominate frag. (ilium/ischium)	(")
R. innominate frag. (ilium/ischium)	(")

Pig

3rd phalange

Nid including ribs and vertebrae

Pit 5 9/12+9/15

Sheep

3 x loose teeth

atlas

axis

sacrum

L. femur (p.f.,d.u.)

R. femur (p.f.,d.u.)

L. humerus (p.u.,d.f.)

R. humerus (p.u.,d.f.)

L. tibia (p.u.,d.u.)

R. tibia (p.u.,d.u.)

L. radius (p.f.,d.u.)

R. radius (p.f.,d.u.)

L. ulna (p.u.)

R. ulna (p.u.)

L. metatarsal (p.f.,d.u.)

R. metatarsal (p.f.,d.u.)

L. metacarpal (p.f.,d.u.)

R. metacarpal (p.f.,d.u.)

L. patella

R. patella

L. calcaneum (d.u.)

R. calcaneum (d.u.)

L. astragalus

R. astragalus

L. lateral malleolus

R. lateral malleolus

sesamoid

11 x carpals/tarsals

8 x 1st phalange (p.u.)

6 x 2nd phalanges (p.u.)

4 x 3rd phalanges

L. scapula frag.

R. scapula frag.

L. innominate

R. innominate

L. horn-core
 R. horn-core
 L. mandible - p3p4M1
 R. mandible, - p3p4M1
 L. maxilla p2p3p4M1
 R. maxilla p2p3p4M1

Nid ribs and vertebrae

Pit 7 9/13

Sheep

1st phalange proximal (p.f.)

Cattle

1st phalange proximal frag. (p.f.)

Pit 8 9/18

Sheep

2 x L. radius proximal (p.f.)	(burnt)
1st phalange (p.u.)	(")
L. astragalus	(")
metatarsal proximal frag. (p.f.)	(")
metacarpal shaft frag.	(")
metapodial distal epiphysis frag. (d.u.)	(")
R. innominate frag. (ilium)	(")

Nid including ribs and vertebrae, burnt and unburnt bone

Pit 9 9/27

Sheep

2 x loose teeth
 atlas
 axis
 L. tibia (p.u.,d.u.)
 R. radius (p.f.,d.u.)
 R. ulna (p.u.)
 R. metatarsal proximal (p.f.)
 L. metacarpal (p.f.,d.f.)
 L. metatarsal (p.f.,d.u.)
 L. metacarpal (p.f.,d.u.)
 R. metacarpal (p.f.,d.u.)
 5 x carpals/tarsals
 tarsal (burnt)
 2 x L. horn-core
 R. horn-core
 L. astragalus
 L. calcaneum(d.u.)
 patella
 L. scapula (p.f.)

6 x 1st phalange (p.f.)
 5 x 2nd phalange (p.f.)
 5 x 3rd phalange (p.f.)
 2 x 1st phalange (p.u.)
 2 x 2nd phalange (p.u.)
 R. innominate (fusing)
 L. mandible - P3P4M1M2M3
 R. mandible - P3P4M1M2M3
 L. mandible p2p3p4M1
 R. mandible p2p3p4M1
 L. maxilla frag. p2p3p4M1/
 R. maxilla frag. p2p3p4M1/
 L. maxilla frag. /P3P4M1M2M3
 R. maxilla P2P3P4M1M2M3

Nid including ribs and vertebrae

Pit 10 9/19

Sheep

R. radius (d.f.)
 R. ulna (p.f.)
 R. humerus distal (d.f.)
 R. humerus proximal (p.f.)
 L. innominate
 5 x carpals/tarsals

Nid including ribs

Pit 12 9/20

Sheep

atlas
 axis
 sacrum
 lateral malleolus 3 x patellae
 L. astragalus
 2 x R. astragalus
 L. calcaneum (d.f.)
 R. calcaneum (d.f.)
 R. calcaneum (d.u.)
 3 x carpals/tarsals
 2 x 1st phalanges (p.f.)
 4 x 1st phalanges (p.u.)
 2 x 2nd phalanges (p.f.)
 3 x 3rd phalanges (p.f.)
 R. metacarpal proximal (p.f.)
 metacarpal distal (d.f.)
 R. metatarsal (p.f.,d.u.)
 R. innominate
 L. innominate
 L. femur (p.f.,d.f.)
 R. femur proximal (p.f.)

R. femur distal (d.f.)
L. femur (p.u.,d.u.)
R. femur proximal (p.u.)
R. femur distal epiphysis (d.u.)
L. humerus (p.f.,d.f.)
L. humerus distal (d.fusing)
R. humerus (p.u.,d.fusing)
L. tibia (p.f.,d.f.)
R. tibia proximal (p.f.)
L. tibia distal (d.f.)
R. tibia distal (d.u.)
R. tibia proximal epiphysis frag. (p.u.)
L. radius (p.f.,d.f.)
L. radius (p.f.,d.u.)
L. ulna (p.f.)
L. ulna (p.u.)
2 x R. scapula (p.f.)
L. scapula (p.f.)

Cattle

tooth frags.

L. tibia (p.u.,d.u.)
L. calcaneum (d.u.)
metapodial distal epiphysis (d.u.)
1st phalange (p.u.)
2 x 2nd phalanges (p.u.)
2 x 3rd phalanges (p.u.)
R. mandible p2p3p4/

Nid including ribs and vertebrae

Pit 13 9/22

Nid vertebra

Pit 14 9/25

Cattle

L. femur (p.u.,d.u.)
R. femur (p.u.,d.u.)
R. humerus (p.u.,d.u.)
L. radius proximal (p.u.)
R. radius proximal (p.u.)
6 x 1st phalange (p.u.)
6 x 2nd phalange (p.u.)
6 x 3rd phalange (p.u.)
L. astragalus
R. astragalus
L. calcaneum (d.u.)
R. calcaneum (d.u.)

R. innominate frag. (ilium/ischium)
 L. tibia proximal epiphysis (p.u.)
 R. tibia proximal epiphysis (p.u.)

Nid including ribs and vertebrae

Pit 16 9/29

Sheep

loose tooth

R. scapula (p.f.)

4 x R. scapula frags.

(burnt)

3 x L. scapula frags.

(")

scapula frag.

(")

R. radius (p.f.,d.u.)

(")

6 x L. radius proximal frags. (p.f.)

(")

4 x R. radius proximal frags. (p.f.)

(")

5 x radius shaft frags.

(")

7 x L. radius distal epiphyses (d.u.)

(")

6 x R. radius distal epiphyses (d.u.)

(")

5 x L. ulna frags.

(")

4 x R. ulna frags.

(")

13 x innominate frags.

(")

35 x metapodial distal epiphysis frags.

(")

2 x L. metacarpal proximal (p.f.)

(")

7 x R. metacarpal proximal (p.f.)

(")

2 x metacarpal shaft frags.

(")

2 x R. metatarsal proximal (p.f.)

(")

12 x metatarsal proximal (p.f.)

(")

metatarsal shaft frag.

(")

1st phalange (p.f.)

(")

17 x 1st phalange (p.u.)

(")

8 x 3rd phalange frags.

(")

2 x L. humerus distal frags. (d.f.)

(")

2 x L. humerus distal epiphysis frags.

(")

4 x R. humerus frags. (d.f.)

(")

2 x humerus distal epiphysis frags.

(")

L. tibia proximal epiphysis (p.u.)

(")

R. tibia proximal epiphysis (p.u.)

(")

2 x L. tibia distal (d.u.)

(")

3 x L. tibia distal epiphysis (d.u.)

(")

R. tibia distal (d.u.)

(")

3 x R. tibia distal epiphysis (d.u.)

(")

femur proximal epiphysis (p.u.)

(")

3 x femur distal frags. (d.u.)

(")

6 x L. astragalus frags.

(")

4 x R. astragalus frags.

(")

26 x carpals/tarsals

(")

3 x L. calcaneum (d.u.)

(")

4 x R. calcaneum (d.u.)

(")

R. calcaneum frag.

(")

5 x patella

(")

2nd phalange (p.f.)

(")

18 x 2nd phalange (p.u.)

(")

Nid burnt bone

Pit 17 9/30

Nid burnt and unburnt bone

Pit 18 9/31

Sheep

atlas frags. (neonatal)

axis (")

Nid vertebra

Pit 19 9/34

Sheep

L. astragalus

R. astragalus

R. scapula (p.f.)

L. radius distal epiphysis (d.u.)

R. tibia proximal epiphysis (p.u.)

R. tibia distal epiphysis (d.u.)

femur proximal epiphysis (p.u.)

sacrum

atlas

R. humerus (p.u.)

L. humerus proximal (p.u.) (burnt)

L. humerus distal (d.f.)

R. femur distal epiphysis (d.u.)

R. calcaneum (d.u.)

Nid including ribs and vertebrae

Below floor 9/32

Cattle

metapodial distal epiphysis frag. (d.u.) (burnt)

Nid unburnt bone

Sand below floor 9/28+9/23+9/5

Sheep

carpal

patella

R. femur proximal (p.u.)

L. innominate frag. (ischium)

Cattle

2nd phalange (p.u.) (neonatal)

Pig

L. mandible /-M-/

Fish

2 x fin rays - Gadoid sp. (Id. by S. Colley, Faunal Remains Project, Southampton)

Nid burnt and unburnt bone

Floor 9/3+9/2

Sheep

loose tooth

femur proximal (p.f.)

Rodent

humerus - mouse/vole size

Fish

Nid frag.

Bird

Nid frag.

Nid frag.

Cell 10

Pit 10/11

Nid including shaft frags.

Pit 2 10/12

Sheep

atlas

axis

L. femur (p.u.,d.u.)

R. femur (p.u.,d.u.)

L. tibia (p.u.,d.f.)

R. tibia (p.u.,d.f.)

L. humerus (p.u.,d.f.)

R. humerus (p.u.,d.f.)

L. scapula

R. scapula

L. innominate

patella

L. calcaneum (d.u.)

R. calcaneum (d.u.)
L. astragalus
R. astragalus
3 x carpals
2 x lateral malleoli
L. radius (p.f.,d.u.)
R. radius (p.f.,d.u.)
L. ulna (p.u.)
R. ulna (p.u.)

Nid including ribs and vertebrae

Pit under Floor 10/7

Sheep
neo-natal lamb bones

Nid ribs

Sand under Floor 10/5

Sheep
neo-natal lamb bones

Nid frags.

Floor 10/4 + 10/9

Sheep
loose tooth
L. scapula
R. scapula
L. astragalus
L. calcaneum (d.u.)
L. humerus distal (d.f.)
L. innominate frag. (ischium)
R. innominate (fusing)
skull/horn-core frags.
R. radius shaft frag.
R. radius distal epiphysis frag. (d.u.)
neo-natal humerus and tibia bones

Cattle
3 x loose teeth
1st phalange (p.u.) (neo-natal)
3rd phalange (p.u.) (")

Fish
dentary, articular, 2 x ceratohyals, 2 x epihyals pterygoid of Pollachius virens
(Saithe) (Id. by S. Colley, Faunal Remains Project, Southampton)

Bird

2 x nid frags.

Nid including ribs and shaft frags.

Cell 12

Pit 12/6

Sheep

sacral vertebra

Nid rib

Floor 12/4

Cattle

2 x 1st phalange (p.f.)

2nd phalange (p.f.)

Nid frags.

Below Floor 12/4A

Cattle

neo-natal calf frags.

Cell 13

Pit 13/12

Nid ribs and vertebrae

Pit beneath Floor 2 13/8

Sheep

R. scapula

L. radius (p.f.,d.u.)

L. ulna (p.u.)

L. humerus (p.u.,d.f.)

carpal

R. maxilla frag. /p4M1M2

Pig

metapodial distal (d.u.)

Nid including ribs and vertebrae

Floor 2 13/10 + 13/3

Cattle

loose tooth

metacarpal frag. (p.u.,d.u.) (neo-natal)

Deer

R. scapula (p.f.)

Floor 1 13/4 + 13/2

Sheep

loose tooth

Cattle

1st phalange (p.f.)

Nid frags.

Cell 14

Pit 1 14/10

Sheep

loose tooth

R. maxilla frag. P2P3P4M1M2/

L. maxilla frag. /P4M1/

1st phalange (p.f.)

1st phalange (p.u.)

3rd phalange

L. calcaneum (d.f.)

L. tibia proximal epiphysis (p.u.)

R. humerus (p.f.,d.f.)

R. metatarsal (p.f.,d.f.)

Cattle

L. metacarpal proximal (p.u.) (neo-natal)

Nid including ribs and vertebrae

Pit 2 14/4

Sheep

atlas

axis

L. humerus (p.fusing,d.f.)

R. femur (p.fusing,d.fusing)
L. radius (p.f.,d.fusing)
R. radius (p.f.,d.fusing)
L. ulna (p.f.)
R. ulna (p.f.)
4 x 1st phalange (p.f.)
3 x 2nd phalange (p.f.)
3 x 3rd phalange (p.f.)
L. metatarsal (p.f.,d.f.)
L. metacarpal (p.f.,d.f.)
R. metacarpal (p.f.,d.f.)
R. astragalus
R. calcaneum (d.f.)
7 x carpals/tarsals
2 x sesamoids
lateral malleolus
L. scapula
R. innominate

Nid including ribs and vertebrae

Pit 3 14/11

Sheep

R. tibia proximal epiphysis (p.u.)
1st phalange proximal epiphysis (p.u.)

Pig

1st phalange (p.u.) (?neo-natal)
3rd phalange (p.u.) (?neo-natal)

Nid including ribs

Floor 2 14/8

Sheep

loose tooth

Cattle

3rd phalange (p.f.)

Pig

loose tooth
patella
1st phalange (p.u.)
metapodial (p.f.,d.u.)

Whale

Nid frag.

Nid including shaft frags.

Floor 1 14/5 + 14/3

Sheep

2 x loose teeth
1st phalange (p.f.)
2nd phalange (p.f.)
3rd phalange (p.f.)
metapodial distal (d.f.)

North-West Quadrant.

NW Quad. Q/44 + Q/48 + Q/82 Floor

Sheep

2 x loose tooth
femur proximal (p.f.) (burnt)
L. horn-core/skull frag.
foetal lamb bones

Cattle

4 x loose teeth
carpal
atlas frag.
L. mandible frag (ascending ramus)
1st phalange (p.u.)
2 x 1st phalange proximal (p.f.) (burnt)
1st phalange distal (burnt)
3rd phalange (burnt)

Pig

R. radius distal frag. (d.f.) (burnt)
phalange (burnt)
L. tibia distal (d.f.)
L. mandible I1I2I3C -P2P3P4M1M2

Deer

R. ulna (p.f.)

Nid including ribs, vertebrae and shaft frags., burnt and unburnt bone

NW quad. Q/63 + Q/25 Below Floor 1

Sheep

axis frag. (burnt)
L. ulna (p.u.)
R. innominate frag. (ilium/ischium)

Cattle
loose tooth
sesamoid

Pig
loose tooth
L. ulna (p.u.)

Nid including ribs and vertebrae, burnt and unburnt bone

NW Quad. Q/46 Pit 1

Sheep
3 x loose teeth
axis
metapodial distal (d.f.)
R. humerus distal (d.f.)
R. calcaneum frag.
tarsal
femur proximal frag. (p.f.) (burnt)
L. scapula frag. (burnt)
metapodial distal frag. (d.f.) (burnt)
R. maxilla frag. /P3P4M1
foetal sheep bones

Pig
1st phalange (p.u.) (burnt)
L. metacarpal III proximal (p.f.) (burnt)

Nid including ribs and vertebrae, burnt and unburnt bone

NW Quad. Q/5 + Q/7 Pit 2

Sheep
foetal lamb bones

<u>Cattle</u>	
14 x loose teeth	
L. ulna (p.u.)	(neo-natal)
R. ulna (p.u.)	(")
L. femur (p.u.,d.u.)	(")
R. femur (p.u.,d.u.)	(")
L. humerus (p.u.,d.u.)	(")
R. humerus (p.u.,d.u.)	(")
R. tibia (p.u.,d.u.)	(")
R. radius (p.u.,d.u.)	(")
L. radius proximal (p.u.)	(")
L. radius distal (d.u.)	(")
L. metatarsal (p.u.,d.u.)	(")
R. metatarsal (p.u.,d.u.)	(")
L. metacarpal (p.u.,d.u.)	(")
R. metacarpal (p.u.,d.u.)	(")

L. scapula (p.u.)	(")
R. scapula (p.u.)	(")
L. innominate frag. (ilium/ischium)	(")
2 x 1st phalange (p.u.)	(")
2 x 2nd phalange (p.u.)	(")
3rd phalange (p.u.)	(")
R. astragalus	(")
R. calcaneum (d.u.)	(")
L. mandible frag. p2p3/	(")
R. mandible frag. /-p4/	(")
maxilla frag. /MM/	(")
maxilla frag. /M /	(")

Pig

tooth frags.	(burnt)
L. astragalus	(")
R. astragalus	(")
calcaneum distal epiphysis (d.u.)	(")
R. calcaneum frag.	(")
R. ulna frag.	(")
19 x carpals/tarsals	(")
L. radius proximal (p.f.)	(")
L. radius distal epiphysis (d.u.)	(")
L. femur distal epiphysis frag. (d.u.)	(")
R. femur distal epiphysis frag. (d.u.)	(")
L. humerus distal (d.f.)	(")
L. tibia proximal epiphysis frag. (p.u.)	(")
2 x femur proximal epiphysis (p.u.)	(")
R. innominate frag. (ischium)	(")
L. innominate frag. (ischium)	(")
R. scapula frag.	(")
18 x 1st phalange (p.u.)	(")
14 x 2nd phalange (p.u.)	(")
10 x 3rd phalange (p.u.)	(")
L. ulna shaft frag.	(")
2 x R. metacarpal V (p.f.,d.u.)	(")
L. metacarpal V proximal (p.f.)	(")
L. metacarpal V (p.f.,d.u.)	(")
R. metacarpal II (p.f.,d.u.)	(")
R. metacarpal III proximal frag. (p.f.)	(")
R. metacarpal III (p.f.,d.u.)	(")
L. metacarpal IV (p.f.,d.u.)	(")
5 x metapodial distal (d.u.)	(")
2 x L. metatarsal IV proximal frags.(p.f.)	(")
R. metatarsal IV proximal frag. (p.f.)	(")
L. metatarsal III proximal frag. (p.f.)	(")

Nid including ribs and vertebrae, (much) burnt and unburnt bone

NW Quad. Q/8 Pit 3

Sheep

atlas

axis

R. distal femur (d.u.)

patella

R. horn-core

Nid including ribs and vertebrae

NW Quad. Q/52 Pit 5

Pig

18 x loose teeth

L. radius (p.u.,d.u.)

L. ulna (p.u.,d.u.)

R. innominate frag. (ilium/ischium)

patella

R. humerus proximal epiphysis (p.u.)

5 x metapodial distal (d.u.)

L. humerus distal frag. (d.u.)

(burnt)

femur proximal frag. (p.u.)

(")

femur distal frag. (d.u.)

(")

tibia proximal frag. (p.u.)

(")

radius proximal frag. (p.f.)

(")

L. tibia distal frag. (d.u.)

(")

R. ulna frag. (p.u.)

(")

L. calcaneum distal (d.u.)

(")

4 x 1st phalange (p.u.)

(")

4 x 2nd phalange (p.u.)

(")

3 x 3rd phalange (p.u.)

(")

metacarpal III proximal (p.f.)

(")

metacarpal IV proximal (p.f.)

(")

metacarpal V (p.f.,d.u.)

(")

Nid much burnt bone

NW Quad. Q/51 Pit 8

Pig

loose tooth

L. astragalus (burnt)

R. astragalus

L. calcaneum (d.u.)

R. calcaneum frag. (d.u.) (burnt)

4 x carpals/tarsals

L. mandible frag. i1i2 - - -p3p4/

humerus distal epiphysis (d.u.) (burnt)

fibula (p.u.,d.u.)

2 x 1st phalange (p.u.)

2 x 2nd phalange (p.u.)

3rd phalange frag.

2 x 1st phalange (p.u.) (burnt)
 L. metacarpal IV proximal (p.f.)
 L. metacarpal III proximal (p.f.)
 R. metatarsal III proximal (p.f.) (burnt)
 metapodial (p.f,d.u.)
 R. innominate frag. (ilium/ischium)

Nid including much burnt bone

NW Quad. Q/37 Pit 10

Sheep

R. humerus distal (d.f.)	(burnt)
L. humerus distal (d.f.)	(")
metapodial distal (d.f.)	(")
R. astragalus frag.	(")
L. scapula (p.f.)	(")
R. scapula (p.f.)	(")
3rd phalange (p.f.)	(")
4 x 2nd phalange (p.f.)	(")
2 x 1st phalange (p.f.)	(")
2 x sesamoids	(")
carpal	(")
R. humerus proximal (p.f.)	(")
R. femur distal (d.f.)	(")
R. tibia distal (d.f.)	(")
R. ulna frag.	(")

Nid much burnt bone

NW Quad. Q/45 Pit 11

Sheep

foetal lamb bones

Nid ribs including burnt bone

NW Quad. Q/55A Pits 14-16

Sheep

foetal lamb bones

R. ulna (p.f.)	(burnt)
metacarpal shaft frag.	(")
femur proximal epiphysis (p.u.)	(")
L. radius proximal frag. (p.f.)	(")
6 x carpals/tarsals	(")
L. humerus distal frag. (d.f.)	(")
3 x sesamoids	(")
4 x 3rd phalange frags.	(")
L. astragalus	(")
1st phalange (p.u.)	(")

2nd phalange (p.u.)		(")
L. maxilla frag.	p2p3p4M1/	

Cattle

L. femur (p.u.,d.u.)	(neo-natal)
L. innominate frag. (ischium)	(")
R. innominate frag. (ischium)	(")
tibia proximal epiphysis (p.u.)	(")
2 x 2nd phalange (p.u.)	(")
4 x carpals/tarsals	
2 x lateral malleolus	
R. calcaneum frag.	
L. calcaneum frag.	
R. astragalus frags.	
L. radius distal epiphysis frag. (d.u.)	
L. radius proximal frag. (p.f.)	
R. ulna frag.	
metapodial distal frag. (d.f.)	
2 x metapodial distal frag. (d.u.)	
R. radius distal epiphysis frag. (d.u.)	
R. tibia proximal frag. (p.f.)	
L. metatarsal proximal frag. (p.f.)	
humerus distal frag (d.f.)	(burnt)
7 x sesamoids	(")
5 x carpals/tarsals	(")
10 x 1st phalange frags.	(")
6 x 2nd phalange frags.	(")
3 x 3rd phalange frags.	(")
7 x tooth frags.	(")

Pig

4 x loose teeth	(burnt)
2nd phalange (p.u.)	(")
metapodial distal epiphysis (d.u.)	(")
R. metatarsal III proximal (p.f.)	(")

Nid much burnt bone

NW Quad. Q/70 Pit 17

Cattle

2 x loose teeth	(burnt)
9 x carpals/tarsals	(")
2 x lateral malleolus	(")
3 x 1st phalange (p.u.)	(")
2 x 2nd phalange (p.u.)	(")
2 x 3rd phalange	(")
metapodial distal epiphysis frag. (d.u.)	(")

Nid much burnt bone

NW Quad. Q/67 Pit 19

Cattle

loose tooth

Nid including ribs, burnt and unburnt bone

NW Quad. Q/61 Pit 20

Cattle

2nd phalange (p.f.) (burnt)

Nid burnt bone

NW Quad. Q/30 + Q/42 + Q/69 Pit 21

Sheep

14 x loose teeth

L. metacarpal (p.f.,d.f.)

R. metacarpal (p.f.,d.f.)

L. metatarsal (p.f.,d.f.)

R. metatarsal (p.f.,d.f.)

R. radius (p.f.,d.f.)

L. radius (p.f.,d.f.)

R. femur (p.f.,d.f.)

L. femur proximal (p.f.)

L. femur distal (d.f.)

R. tibia (p.f.,d.f.)

L. tibia (p.f.,d.f.)

L. humerus proximal (p.f.)

L. humerus distal (d.f.)

R. humerus distal (d.f.)

L. scapula (p.f.)

R. scapula (p.f.)

patella

L. ulna (p.f.)

R. ulna (p.f.)

L. calcaneum (d.f.)

R. calcaneum (d.f.)

L. astragalus

R. astragalus

7 x carpals/tarsals

lateral malleolus

7 x 3rd phalanges (p.f.)

6 x 2nd phalanges (p.f.)

8 x 1st phalanges (p.f.)

L. innominate

R. innominate

atlas

axis

skull frags.

horn-core frags.

sternal frag.

L. mandible -P3P4M1M2M3
 R. mandible frag. /C/ (erupting)
 R. mandible frag. /M2M3
 maxilla frag. /M/
 foetal lamb bones

Cattle

tooth frag. (burnt)
 2 x metapodial distal epiphysis frags. (d.u.) (")
 metapodial shaft frag. (")
 astragalus frag. (")
 2 x carpals (")
 3 x 1st phalange proximal epiphysis (p.u.) (")
 5 x 2nd phalange (p.u.) (")
 3rd phalange (")

Nid including ribs and vertebrae and much burnt bone

NW Quad. Q/36 Pit 22 (brown ditch 22)

Sheep

atlas
 axis
 L. humerus (p.u.,d.f.)
 R. humerus (p.u.,d.f.)
 R. ulna (p.u.)
 L. radius (p.f.,d.u.)
 R. radius (p.f.,d.u.)
 metatarsal shaft frag. (burnt)
 metacarpal shaft frag. (")
 foetal lamb bones

Pig

2nd phalange (p.u.)

Nid including ribs and vertebrae, burnt and unburnt bone

NW Quad. Q/66 Pit 23

Nid burnt bone

North-East Quadrant

NE Quad. Q/2 Floor by cells 11-13

Sheep

R. innominate frag. (ischium)
 2 x L. calcaneum (d.u.)
 R. calcaneum (d.f.)
 1st phalange (p.f.)
 3rd phalange

R. humerus (p.u.)
 L. metacarpal proximal (p.f.)
 R. metacarpal proximal (p.f.)
 L. radius distal (d.u.)
 R. mandible p2p3p4M1
 R. scapula frag. (chewed)
 skull frag.
 L. horn-core
 R. horn-core

Cattle

10 x loose teeth
 axis frag.
 L. metacarpal proximal (p.f.)
 tarsal
 L. ulna frag.
 2 x R. astragalus (neo-natal)
 R. calcaneum (")
 2 x L. ulna (p.u.) (")
 R. ulna (p.u.) (")
 L. femur (p.u.,d.u.) (")
 R. femur (p.u.,d.u.) (")
 L. tibia (p.u.,d.u.) (")
 L. tibia distal (d.u.) (")
 2 x R. tibia (p.u.,d.u.) (")
 L. humerus (p.u.,d.u.) (")
 L. humerus proximal (p.u.) (")
 2 x R. humerus (p.u.,d.u.) (")
 L. radius (p.u.,d.u.) (")
 L. radius proximal (p.f.) (")
 R. radius (p.u.,d.u.) (")
 metapodial proximal (p.u.) (")
 metapodial distal (d.u.) (")
 4 x 1st phalanges (p.u.) (")
 7 x 2nd phalanges (p.u.) (")
 6 x 3rd phalanges (")
 L. innominate frag. (ilium/ischium)(")
 R. innominate frag. (ilium/ischium)(")

Pig

L. maxilla frag. /-P3p4M1

Nid including ribs and vertebrae, burnt and unburnt bone

NE Quad. Q/12 Pit 1

Sheep

2 x loose teeth
 atlas
 axis
 L. mandible p2p3p4M1M2
 R. mandible - - p4M1M2
 sacrum
 L. maxilla frag.p2p3p4M1M2/

R. maxilla frag.p2p3- M1M2/
 L. horn-core
 L. patella
 R. patelle
 L. astragalus
 R. astragalus
 2 x L. calcaneum (d.u.)
 R. calcaneum (d.u.)
 L. ulna (p.u.)
 R. ulna (p.u.)
 L. humerus (p.u.,d.f.)
 R. humerus (p.u.,d.f.)
 L. radius (p.f.,d.u.)
 R. radius (p.f.,d.u.)
 L. tibia (p.u.,d.f.)
 R. tibia (p.u.,d.f.)
 L. femur (p.u.,d.u.)
 R. femur (p.u.,d.u.)
 L. scapula (p.f.)
 R. scapula (p.f.)
 L. innominate
 R. innominate

Cattle

2nd phalange (p.u.)
 1st phalange (p.f.) (burnt)

Nid including ribs and vertebrae, burnt and unburnt bone

NE Quad. Q/6+21 Pit 2

Sheep

loose tooth	
R. humerus proximal epiphysis (p.u.)	(burnt)
patella	(")
3rd phalange	(")
1st phalange proximal (p.f.)	(")
metapodial proximal frag.	(")
L. astragalus	(")
2 x metapodial shaft frags.	(")

Cattle

7 x loose teeth	(burnt)
L. humerus distal epiphysis (d.u.)	(")
L. humerus distal frag. (d.f.)	(")
2 x L. radius distal epiphysis (d.u.)	(")
R. radius proximal frag. (p.f.)	(")
R. tibia proximal (p.u.)	(")
R. tibia distal (d.u.)	(")
L. innominate frag. (ischium)	(")
2 x R. innominate frag. (ilium)	(")
4 x metapodial distal frags. (d.u.)	(")
5 x metapodial shaft frags.	(")
R. metatarsal proximal frag. (p.f.)	(")

2 x L. metatarsal proximal frags. (p.f.)	(")
R. metacarpal proximal frag. (p.f.)	(")
metacarpal proximal frag. (p.f.)	(")
2 x lateral malleoli	(")
horn-core frag.	(")
23 x sesamoids	(")
calcaneum distal epiphysis (d.u.)	(")
L. calcaneum frag.	(")
2 x L. astragalus frag.	(")
R. astragalus frag.	(")
R. astragalus	(")
13 x carpals/tarsals	(")
12 x 1st phalanges (p.f.)	(")
1st phalange (p.u.)	(")
8 x 2nd phalanges (p.f.)	(")
12 x 2nd phalanges (p.u.)	(")
6 x 3rd phalanges	(")

Pig

loose tooth	
R. humerus distal frag. (d.f.)	(burnt)
R. ulna frag.	(")
L. ulna frag.	(")
2 x metapodial distal epiphyses (d.u.)	(")
2 x carpals/tarsals	(")
2nd phalange (p.u.)	(")
3 x 3rd phalange frags.	(")

Nid much burnt bone

NE Quad. Q/14 Pit 3

Sheep

metapodial distal epiphysis (d.u.)

Cattle

loose tooth

Pig

maxilla frag. /MM/

Nid including ribs and vertebrae

NE Quad. Q/10 + Q/19 Pit 4

Sheep

3 x loose teeth
atlas
axis
sacrum
L. femur (p.u.,d.u.)
R. tibia (p.u.,d.f.)
L. tibia proximal epiphysis (p.u.)

L. humerus proximal epiphysis (p.u.)
 2 x L. radius (p.f.,d.u.)
 2 x R. radius (p.f.,d.u.)
 2 x L. ulna (p.u.)
 2 x R. ulna (p.u.)
 2 x L. metatarsal (p.f.,d.u.)
 2 x R. metatarsal (p.f.,d.u.)
 R. metacarpal (p.f.,d.u.)
 L. calcaneum (d.u.)
 R. calcaneum (d.u.)
 R. astragalus
 5 x carpals/tarsals
 lateral malleolus
 9 x 1st phalange (p.f.)
 8 x 2nd phalange (p.f.)
 4 x 3rd phalange
 patella
 2 x L. scapula
 R. innominate frag (ilium/pubis)
 L. maxilla frag. -p3p4M1
 L. maxilla frag. /p3p4M1
 2 x L. horn-core
 R. horn-core

Cattle

loose tooth
 R. scapula frag.
 R. innominate frag. (ilium) (neo-natal)
 2nd phalange (p.u.) (")
 2 x 3rd phalange (p.u.) (")
 6 x carpals/tarsals (burnt)
 8 x 2nd phalange frags. (p.f.) (")
 patella (")
 17 x sesamoids (")
 2 x lateral malleolus (")
 L. astragalus frag. (")
 7 x 1st phalange frags. (p.f.) (")
 6 x 3rd phalange frags. (")
 R. tibia distal frag. (d.f.) (")
 radius proximal frag. (p.f.) (")
 R. radius distal frag. (")
 L. radius proximal frag. (p.f.) (")
 R. metatarsal proximal (p.f.) (")
 L. metatarsal proximal frag. (p.f.) (")
 L. metacarpal proximal frag. (p.f.) (")
 2 x R. metacarpal proximal frag. (p.f.) (")
 2 x metapodial shaft frags. (")
 5 x metapodial distal frags. (d.f.) (")

Pig

3rd phalange frag.

Nid including ribs and vertebrae and much burnt bone

NE Quad. Q/27 Pit 6

Sheep

4 x loose teeth
L. femur (p.u.,d.u.)
R. proximal femur (p.u.)
R. distal femur (d.u.)
L. tibia (p.f.,d.f.)
L. tibia (p.u.,d.u.)
R. tibia shaft frag.
metatarsal shaft frag. (burnt)
L. metatarsal (p.f.,d.u.)
R. metatarsal (p.f.,d.u.)
R. metacarpal (p.f.,d.u.)
L. metacarpal proximal (p.f.)
patella
2 x 3rd phalanges (p.f.)
6 x 2nd phalanges (p.f.)
7 x 1st phalanges (p.f.)
lateral malleolus
L. astragalus
R. calcaneum (d.u.)
L. calcaneum (d.u.)
3 x carpals/tarsals
astragalus frag.
L. scapula frag.
R. scapula (p.f.)
R. innominate frag. (ilium/ischium) (fused)
L. innominate frag. (ilium/ischium) (fused)
sacral vertebrae frag.
horn-core frags.
L. mandible -p3p4M1M2
R. mandible frag. -- p4M1/
L. maxilla frag. /p4M1M2
R. maxilla frag. -p3p4M1M2

Nid including ribs and vertebrae

NE Quad. Q/53 Pit 7

Cattle

11 x loose teeth
horn-core frags. (burnt)
L. ulna frag. (")
5 x 3rd phalange (p.f.) (")
6 x 2nd phalange (p.f.) (")
5 x 1st phalange (p.f.) (")
6 x sesamoids (")
lateral malleolus (")
humerus proximal frag. (p.f.) (")
metapodial proximal frag. (p.f.) (")
femur proximal frag. (")
R. mandible frag. (ascending ramus) (")

Nid much burnt bone

NE Quad. Q/28 Pit 8

Sheep

L. mandible p2p3p4M1M2 (M2 erupting)
R. mandible p2p3p4M1M2 (M2 erupting)
L. mandible - P3P4M1M2M3
R. mandible - P3p4M1M2M3
R. maxilla frag. p2p3p4M1/
L. maxilla frag. /p3p4M1/
R. maxilla frag. /P3P4M1M2
L. maxilla frag. /M2M3
R. tibia (p.f.,d.f.)
L. tibia distal (d.f.)
R. humerus (p.f.,d.f.)
L. humerus proximal (p.f.)
L. femur proximal (p.f.)
L. ulna frag.
L. radius (p.f.,d.f.)
L. metatarsal (p.f.,d.f.)
R. metatarsal (p.f.,d.f.)
L. metacarpal (p.f.,d.f.)
R. metacarpal (p.f.,d.f.)
L. scapula frag.
R. scapula (p.f.)
R. innominate (ilium/ischium/pubis)
L. innominate frag. (ilium/ischium)
L. innominate frag. (acetabulum/pubis)
L. astragalus
L. calcaneum (d.f.)
4 x 1st phalanges (p.u.)
horn-core frags.
atlas
axis
sacral vertebra frag.

Cattle

2 x loose teeth (unerupted molars)
2 x astragalus (neo-natal)
2 x calcaneum (")
3 x metacarpal (")
3 x metatarsal (")
R. ulna (")
4 x phalanges (")
R. humerus (")
R. femur (")
L. femur (")
2 x R. radius (")
L. radius distal (")
2 x L. scapula (")
2 x R. scapula (")
skull frags. (")
L. innominate frags. (ischium)(")

L. innominate frag. (ilium) (")
R. innominate frag. (ischium) (")

Nid including ribs and vertebrae

NE Quad. Q/54 Pit 10

Sheep

atlas

axis

sacrum

R. femur (p.f.,d.f.)

L. femur distal (d.f.)

L. femur (p.u.,d.u.)

R. femur (p.u.,d.u.)

R. tibia (p.u.,d.u.)

L. tibia proximal (p.f.)

L. tibia shaft frag.

L. humerus distal (d.f.)

L. humerus distal (d.fusing)

R. humerus distal (d.fusing)

R. radius (p.f.,d.f.)

L. radius (p.f.,d.u.)

R. radius (p.f.,d.u.)

L. radius (p.u.,d.u.)

R. radius (p.u.,d.u.)

R. radius distal (d.f.)

L. metatarsal (p.f.,d.u.)

R. metatarsal proximal (p.f.)

L. metacarpal (p.f.,d.u.)

R. metacarpal (p.f.,d.u.)

patella

R. calcaneum (d.u.)

R. astragalus

8 x 1st phalange (p.f.)

L. scapula (p.f.)

R. scapula (p.f.)

L. innominate frag. (ilium/ischium)

R. innominate frag. (ilium/ischium)

L. mandible - P3P4M1M2M3

R. mandible - P3P4M1M2M3

L. maxilla frag. - P3P4/

L. maxilla frag. /M1M2M3

R. maxilla frag. /P4M1M2M3

L. horn-core/skull frags.

R. horn-core/skull frags.

Cattle

9 x loose teeth

L. femur (p.u.,d.u.)

R. femur (p.u.,d.u.)

R. tibia (p.u.,d.u.)

R. metacarpal (p.f.,d.u.)

L. calcaneum (d.u.)

R. calcaneum (d.u.)
astragalus
7 x phalanges (p.u.)
L. innominate frag. (ilium/ischium)
R. innominate frag. (ilium/ischium)
L. mandible frag. p2p3p4/
L. mandible frag. /p4/
R. mandible frag. - p3p4/

Nid including ribs and vertebrae

NE Quad. Q/22 + Q/32

Sheep

R. humerus proximal epiphysis (p.u.)
R. astragalus
R. calcaneum (d.f.)
R. lateral malleolus

Cattle

6 x loose teeth
L. femur (p.u.,d.u.)
R. femur (p.u.,d.u.)
L. tibia (p.u.,d.u.)
R. tibia (p.u.,d.u.)
L. radius (p.u.,d.u.)
R. radius (p.u.,d.u.)
L. humerus (p.u.,d.u.)
R. humerus (p.u.,d.u.)
L. metatarsal (p.f.,d.u.)
R. metatarsal (p.f.,d.u.)
L. metacarpal (p.f.,d.u.)
R. metacarpal (p.f.,d.u.)
L. astragalus
R. astragalus
L. calcaneum (d.u.)
R. calcaneum (d.u.)
6 x 1st phalange (p.u.)
4 x 2nd phalange (p.u.)
4 x 3rd phalange (p.u.)
L. scapula (p.u.)
R. scapula (p.u.)
L. innominate frag. (ilium/ischium)
R. innominate frag. (ischium)
L. mandible frag. p2p3/
R. mandible p2p3p4
L. tibia (p.u.,d.u.)
R. ulna (p.u.)
metapodial distal (d.u.)
2nd phalange (p.u.)
3rd phalange

Nid including ribs and vertebrae

NE Quad. Q/24 Pit 12

Nid including ribs and vertebrae, burnt and unburnt bone

NE Quad. Q/29 pit 13

Sheep

3 x loose teeth

atlas

axis frag.

sacral vertebrae frag.

L. patella

R. patella

L. calcaneum (d.u.)

R. calcaneum (d.u.)

L. lateral malleolus

R. lateral malleolus

4 x carpals/tarsals

L. astragalus

R. astragalus

L. ulna (p.u.)

R. ulna frag.

L. scapula frag.

R. scapula frag.

R. innominate frag. (ilium/pubis/ischium)

L. radius (p.f.,d.u.)

R. radius (p.f.,d.u.)

L. tibia shaft frag.

R. tibia (p.u.,d.f.)

L. femur distal epiphysis (d.u.)

L. femur proximal (p.u.)

R. femur distal (d.u.)

R. femur proximal epiphysis (p.u.)

L. humerus (p.u.,d.f.)

R. humerus (p.u.,d.f.)

horn-core frag.

L. mandible - p3p4M1M2

R. mandible frag.

R. maxilla frag. - p3p4M1

Nid including ribs and vertebrae

NE Quad. Q/31 Pit 14

Sheep

2 x loose teeth

atlas

axis

sacral vertebrae

L. humerus (d.fusing,p.u.)

R. humerus (d.fusing,p.u.)

L. femur (d.u.,p.u.)

R. femur (d.u.,p.u.)

L. tibia (d.u.,p.u.)
 R. tibia (d.u.,p.u.)
 L. radius (p.f.,d.u.)
 R. radius (p.f.,d.u.)
 L. metacarpal (p.f.,d.u.)
 R. metacarpal (p.f.,d.u.)
 L. metatarsal (p.f.,d.u.)
 R. metatarsal (p.f.,d.u.)
 L. ulna (p.u.)
 patella
 4 x carpals/tarsals
 L. calcaneum (p.u.)
 R. calcaneum (p.u.)
 L. astragalus
 R. astragalus
 L. scapula (p.u.)
 R. scapula (p.u.)
 L. innominate (ilium/ischium/pubis) (unfused)
 R. innominate (ilium/ischium/pubis) (unfused)
 6 x 1st phalanges (p.u.)
 3rd phalange
 L. mandible p2p3p4M1
 R. mandible p2p3p4M1
 L. maxilla frag. p2p3p4/
 R. maxilla frag. p2p3p4/
 2 x horn-cores

Nid including ribs and vertebrae

NE Quad. Q/33 Pit 15

Sheep

atlas

axis

L. femur (p.u.,d.u.)
 R. femur (p.u.,d.u.)
 L. humerus (p.u.,d.f.)
 R. humerus (p.u.,d.f.)
 L. tibia (p.u.,d.u.)
 R. tibia distal (d.u.)
 R. tibia proximal epiphysis (p.u.)
 L. ulna (p.u.)
 R. ulna (p.u.)
 L. radius (p.f.,d.u.)
 R. radius (p.f.,d.u.)
 L. metacarpal (p.f.,d.u.)
 R. metacarpal (p.f.,d.u.)
 L. metatarsal (p.f.,d.u.)
 R. metatarsal (p.f.,d.u.)
 L. scapula frag.
 R. scapula frag.
 R. innominate frag. (ilium/ischium)
 L. innominate frag. (ilium)
 L. calcaneum (d.u.)

R. calcaneum (d.u.)
 L. astragalus
 R. astragalus
 tarsal
 3rd phalange
 6 x 1st phalange (p.u.)
 L. mandible - p3p4M1
 R. mandible - p3p4M1
 L. maxilla frag. p2p3p4M1
 R. maxilla frag. p2p3p4M1
 L. horn-core
 R. horn-core

Nid including ribs and vertebrae

NE Quad. Q/20 Pit 18

Sheep

L. ulna frag. (p.u.) (burnt)
 L. radius proximal epiphysis (p.u.) (")
 humerus proximal frag. (p.f.) (")
 R. innominate frag. (ischium) (")

Cattle

4 x 2nd phalange (p.u.) (burnt)
 metapodial distal epiphysis (d.u.) (")
 carpal

Pig

2nd phalange (p.u.) (burnt)
 R. tibia distal epiphysis frag. (d.u.) (")

Nid much burnt bone

NE Quad. Q/68 Pit 22

Sheep

femur proximal (p.u.) (burnt)
 L. calcaneum distal frag. (d.f.) (")

Cattle

18 x loose teeth	(burnt)
metacarpal V	(")
R. femur proximal (p.f.)	(")
L. femur distal frag. (d.f.)	(")
R. femur distal frag. (d.f.)	(")
atlas frag.	(")
2 x L. astragalus frag.	(")
R. astragalus frag.	(")
humerus proximal frag	(")
horncore frags.	
L. calcaneum distal frag. (d.f.)	(burnt)
R. calcaneum distal frag. (d.f.)	(")

6 x carpals/tarsals	(")
2 x lateral malleolus	(")
9 x 1st phalange frags. (p.f.)	(")
3 x 2nd phalange frags. (p.f.)	(")
15 x 3rd phalange frags.	(")
R. innominate frag. (pubis)	(")
L. radius proximal frag. (p.f.)	(")
R. ulna proximal frag.	(")
R. radius distal frag. (d.f.)	(")
R. calcaneum frag.	(")
L. humerus distal frag. (d.f.)	(")
14 x sesamoids	(")
9 x metapodial distal frags.	(")
metapodial distal (d.f.)	(")
3 x metapodial proximal frags. (p.f.)	(")

Deer

2 x metapodial shaft frags.	(burnt)
L. metatarsal proximal frag. (p.f.)	(")
metapodial distal frag. (d.f.)	(")
L. ulna frag.	(")

Nid much burnt bone

NE Quad. Q/75 Small pit outside cell 14

Sheep

L. mandible	p2p3p4M1M2 (M2 erupting)
L. mandible	p2p3p4M1M2 (")
atlas (symphysis fusing)	
L. innominate (ilium/ischium fusing)	
R. innominate frag. (pubis/acetabulum)	
R. scapula (p.f.)	
2 x L. metatarsal	(p.f.,d.u.)
2 x R. metatarsal	(p.f.,d.u.)
2 x L. metacarpal	(p.f.,d.u.)
2 x R. metacarpal	(p.f.,d.u.)
R. calcaneum (d.u.)	
12 x carpals/tarsals	
3 x distal sesamoids	
16 x 1st phalanges (p.u.)	
13 x 2nd phalanges (p.u.)	
10 x 3rd phalanges	

Nid ribs and vertebrae

South-West Quadrant

SW Quad. Q/4 + Q/50 + Q/73 + Q/84 Floor

Sheep

7 x loose teeth
atlas
axis frag.
L. scapula
R. scapula
R. calcaneum (d.f.)
L. femur proximal (p.f.)
L. femur distal (d.f.)
R. femur distal (d.f.)
R. femur proximal (p.f.)
R. femur distal epiphysis (d.u.)
L. innominate frag. (ilium)
L. innominate frag. (ischium)
L. innominate frag. (pubis)
2 x R. innominate frag. (ilium)
L. humerus distal (d.f.)
humerus proximal (p.f.)
R. humerus distal (d.f.)
R. astragalus
9 x carpals/tarsals
9 x 1st phalanges (p.f.)
5 x 2nd phalanges (p.f.)
2 x 3rd phalanges
L. metatarsal (p.f.,d.f.)
R. metatarsal (p.f.,d.f.)
L. metacarpal (p.f.,d.f.)
R. metacarpal (p.f.,d.f.)
patella
2 x sesamoids
sacral vertebra
L. radius (p.f.,d.u.)
R. radius (p.f.,d.u.)
R. ulna (p.f.)
R. tibia distal (d.f.)
2 x L. tibia distal (d.f.)
L. horn-core/skull frags.
R. horn-core/skull frags.
R. horn-core
horn-core frag.
L. mandible -P3P4M1M2M3
L. mandible -p3p4M1M2
R. mandible -P3P4M1M2M3
L. maxilla frag. P2P3P4/
L. maxilla frag. /M2M3
R. maxilla frag. /P3P4M1/

Cattle

R. mandible p2p3p4

Pig

L. mandible frag. /P4M1M2M3

Nid including ribs and vertebrae

SW Quad. Q/77 Pit 1

Sheep

L. metatarsal (p.f.,d.u.)

R. metatarsal (p.f.,d.u.)

L. metacarpal (p.f.,d.u.)

R. metacarpal (p.f.,d.u.)

tarsal

8 x 1st phalanges (p.f.)

6 x 2nd phalanges (p.f.)

6 x 3rd phalanges

sesamoid

Cattle

astragalus frag.

SW Quad. Q/80 Pit 3

Sheep

8 x loose teeth

atlas

axis

patella

4 x carpals/tarsals

4 x 1st phalange (p.f.)

2 x 2nd phalange (p.f.)

3rd phalange

L. astragalus

L. calcaneum (d.f.)

R. calcaneum (d.f.)

L. ulna frag.

L. radius (p.f.,d.f.)

L. femur (p.f.,d.f.)

R. femur (p.f.,d.f.)

L. humerus (p.f.,d.f.)

L. tibia (p.f.,d.f.)

R. tibia (p.f.,d.f.)

L. metatarsal (p.f.,d.f.)

R. metatarsal (p.f.,d.f.)

L. metacarpal (p.f.,d.f.)

L. innominate

R. innominate

L. mandible -P3P4M1M2M3

R. mandible frag. -P3P4M1/

L. maxilla frag. P2P3P4/

Nid including ribs and vertebrae

SW Quad. Q/88 Pit 4

Sheep

1st phalange distal frag. (burnt)

Cattle

1st phalange prox. (p.f.) (burnt)

phalange distal frag. (")

lateral malleolus (")

2 x sesamoid (")

Nid much burnt material

SW Quad. Q/71+85 Pit 5

Sheep

ulna frag. (burnt)

carpal (")

Cattle

loose tooth

R. radius distal (d.f.) (")

14 x sesamoids (")

R. metacarpal proximal (p.f.) (")

metacarpal proximal frag. (")

lateral malleolus (")

11 x carpals/tarsals (")

2 x 3rd phalange (")

metapodial proximal frag. (")

3 x metapodial distal frag. (d.f.) (")

skull frag. (")

8 x 1st phalange frags. (p.f.) (")

5 x 2nd phalange frags. (p.f.) (")

L. radius proximal frag. (p.f.) (")

metacarpal V (")

R. tibia proximal (p.f.) (")

L. innominate frag. (ischium) (")

R. calcaneum frag. (")

4 x horn-core frags. (")

R. ulna frag. (")

L. humerus distal frag. (")

Pig

R. metacarpal IV proximal (p.f.) (burnt)

loose tooth

L. femur proximal (p.u.)

femur distal frag. (d.u.)

femur proximal frag. (p.u.)

L. tibia distal (d.u.)

L. humerus distal (d.u.)

L. radius proximal (p.u.)

L. radius distal epiphysis (d.u.)

L. scapula frag.

R. innominate frag. (ilium/ischium)
R. calcaneum (d.u.)
R. metacarpal III (p.f.,d.u.)
R. metacarpal IV (p.f.,d.u.)
R. metatarsal IV (p.f.,d.u.)
L. metatarsal IV (p.f.,d.u.)
1st phalange (p.u.)
2nd phalange (p.u.)
tarsal

Deer

metapodial distal frag. (d.f.) (burnt)
L. radius distal frag. (d.f.) (")

Nid including unburnt vertebrae and ribs, and much burnt material

SW Quad. Q/97+98 pit 9

Sheep

3rd phalange

Nid vertebrae, ribs and long bone frag.

SW Quad. Q/90 Pit 12

L. femur (p.f.,d.f.)
R. femur (p.f.,d.f.)
L. humerus (p.f.,d.f.)
R. humerus (p.f.,d.f.)
L. tibia (p.f.,d.f.)
R. tibia (p.f.,d.f.)
L. radius (p.f.,d.f.)
R. radius (p.f.,d.f.)
L. ulna (p.f.)
R. ulna (p.f.)
L. metatarsal (p.f.,d.f.)
R. metatarsal (p.f.,d.f.)
L. metacarpal (p.f.,d.f.)
R. metacarpal (p.f.,d.f.)
L. calcaneum (d.f.)
R. calcaneum (d.f.)
L. astragalus
R. astragalus
lateral malleolus
L. patella
R. patella
14 x tarsals/carpals
4 x sesamoids
8 x 1st phalanges (p.f.)
8 x 2nd phalanges (p.f.)
8 x 3rd phalanges
sternal frags.
atlas

axis
sacrum
L. innominate
R. innominate
L. scapula (p.f.)
R. scapula (p.f.)

Nid including ribs and vertebrae

SW Quad. Q/87+94 Pit 14

Sheep
carpal

Cattle

2 x R. calcaneum frag.	(burnt)
R. humerus distal frag. (d.f.)	(")
L. radius proximal frag. (p.f.)	(")
L. radius distal epiphysis frag. (d.u.)	(")
3 x loose teeth	(")
L. ulna frag.	(")
calcaneum distal frag. (d.f.)	(")
9 x carpals/tarsals	(")
astragalus frag.	(")
6 x 3rd phalange frags.	(")
7 x 2nd phalange frags. (p.f.)	(")
6 x 1st phalange frags. (p.f.)	(")
22 x sesamoids	(")
3 x metapodial distal epiphysis frags. (d.u.)	(")

Nid unburnt ribs and vertebrae, and much burnt bone

SW Quad. Q/93 Pit 15

Sheep
loose tooth
R. radius (p.f.,d.u.)
L. metatarsal (p.f.,d.u.)
R. maxilla frag. p2p3/

Nid including ribs and vertebrae, burnt and unburnt bone

SW Quad. Q/89 Pit 16

Sheep
8 x loose teeth
6 x 3rd phalanges
9 x 2nd phalanges (p.f.)
12 x 1st ph (p.f.)
3 x patella
5 x tarsals
R. calcaneum (d.f.)

R. calcaneum (d.u.)
 L. calcaneum (d.f.)
 L. calcaneum (d.u.)
 2 x R. astragalus
 L. ulna (p.f.)
 L. ulna (p.u.)
 R. ulna (p.f.)
 R. ulna (p.u.)
 2 x atlas
 2 x axis
 L. femur (p.u.,d.u.)
 L. femur (p.f.,d.f.)
 R. femur (p.u.,d.u.)
 R. femur (p.f.,d.f.)
 L. humerus (p.u.,d.f.)
 L. humerus (p.f.,d.f.)
 R. humerus (p.u.,d.f.)
 R. humerus (p.f.,d.f.)
 L. tibia (p.u.,d.u.)
 L. tibia (p.f.,d.f.)
 R. tibia (p.u.,d.u.)
 R. tibia (p.f.,d.f.)
 2 x sacrum
 2 x L. innominate
 2 x R. innominate
 2 x L. scapula
 2 x R. scapula
 L. radius (p.f.,d.u.)
 L. radius (p.f.,d.f.)
 R. radius (p.f.,d.u.)
 R. radius (p.f.,d.f.)
 L. metacarpal (p.f.,d.f.)
 R. metacarpal (p.f.,d.f.)
 L. metacarpal (p.f.,d.u.)
 R. metacarpal (p.f.,d.u.)
 L. metatarsal (p.f.,d.f.)
 R. metatarsal (p.f.,d.f.)
 L. metatarsal (p.f.,d.u.)
 R. metatarsal (p.f.,d.u.)
 2 x L. horn-core/skull frags.
 R. horn-core/skull frag.
 L. mandible -P3P4M1M2M3
 R. mandible -P3P4M1M2M3
 R. mandible frag. - - -M1M2/
 L. maxilla frag. P2P3P4M1/
 R. maxilla P2P3 -M1M2M3
 L. maxilla frag. /M1M2M3
 L. maxilla frag. /M3

Nid including ribs and vertebrae

SW Quad. Q/100 Pit 18

Sheep

L. astragalus
patella

Nid including ribs

SW Quad. Q/104 Pit 20

Sheep

atlas

axis

L. femur (p.u.,d.u.)
R. femur distal (d.u.)
R. femur proximal (p.u.)
L. tibia proximal (p.u.)
L. tibia distal (d.u.)
R. tibia distal (d.u.)
R. tibia proximal epiphysis (p.u.)
L. radius (p.f.,d.u.)
L. calcaneum (d.u.)
R. calcaneum (d.u.)
L. astragalus
R. astragalus
L. patella
R. patella
L. scapula
R. scapula
L. innominate frag. (ilium/ischium)
R. innominate frag. (ilium)
R. innominate frag. (pubis)

Nid including ribs and vertebrae

SW Quad. Q/103 Pit 21

Nid frags.

SW Quad. Q/4+50+73+84 Floor

Sheep

7 x loose teeth

R. scapula

humerus proximal frag. (p.f.)

R. humerus distal (d.f.)

L. femur distal (d.f.)

R. femur distal (d.f.)

R. ulna (p.f.)

L. tibia distal (d.f.)

R. tibia distal (d.f.)

L. radius (p.f.,d.u.)

R. radius (p.f.,d.u.)
 L. metatarsal (p.f.,d.f.)
 R. metatarsal (p.f.,d.f.)
 L. metacarpal (p.f.,d.f.)
 R. metacarpal (p.f.,d.f.)
 7 x 1st phalange (p.f.)
 5 x 2nd phalange (p.f.)
 2 x 3rd phalange
 8 x carpals/tarsals
 patella
 2 x sesamoids
 sacral vertebra
 L. calcaneum frag.
 L. innominate frag. (ischium)
 L. innominate frag. (pubis)
 R. innominate frag. (ilium)
 L. mandible -P3p4M1M2M3
 R. mandible -P3P4M1M2M3
 L. maxilla frag. P2P3P4/
 R. maxilla frag. /P3P4M1/
 L. maxilla frag. /M2M3
 L. horn-core/skull frag.
 R. horn-core/skull frag.
 L. humerus distal (d.f.)
 R. astragalus
 atlas
 axis frag.
 L. scapula
 R. calcaneum (d.f.)
 L. femur proximal (p.f.)
 R. femur proximal (p.f.)
 L. innominate frag. (ilium)
 R. horn-core
 horn-core frag.
 L. mandible -p3p4M1M2
 R. innominate frag. (ilium)
 R. femur distal epiphysis (d.u.)
 L. tibia distal (d.f.)
 2 x 1st phalange (p.f.)
 carpal

Cattle

R. mandible p2 -p4

Pig

L. mandible /P4M1M2M3

Nid including ribs and vertebrae

SE QUADRANT

SE Quad. Q/23 Floor

Sheep

3 x loose teeth
tarsal
L. metacarpal (p.f.,d.u.)

Cattle

6 x loose teeth
3 x 1st phalange (p.f.)
sesamoid
4 x carpals/tarsals
R. ulna (p.u.) (?foetal)
R. metacarpal (p.u.,d.u.) (?foetal)
mandible frag.

Pig

loose tooth

Red Deer

L. humerus distal (d.u.)
R. humerus distal (d.u.)
1st phalange (p.u.)
L. radius distal (d.u.)

Bird

ulna - Alca torda (Razorbill)

Nid including ribs and vertebrae

WHEELHOUSE A

WH/A/1+4+5

Sheep

3 x loose teeth
L. metacarpal proximal (p.f.)
metapodial frag. (d.u.)
R. radius proximal (p.u.)
2nd phalange (p.f.)
2 x carpals
L. mandible frag. -p3p4/
L. mandible frag. p2p3p4/
3 x L. mandible frags.
R. mandible frag.

Cattle

R. scapula proximal (p.f.)
L. tibia proximal frag. (p.f.)
2 x tibia shaft frags.
6 x horn-core frags.
calcaneum distal epiphysis (d.u.)
cranium frags.
L. mandible frag.

Red Deer

L. sacral frag.

Dog

loose tooth

WH/A/2

Sheep

L. femur (p.f.,d.f.)
L. tibia (p.f.,d.f.)
L. metatarsal (p.f.,d.f.)
R. metacarpal (p.f.,d.f.)
metacarpal shaft frag.
L. femur proximal (p.f.)
R. tibia distal (d.u.)
2 x 1st phalanges (p.f.)
3 x 2nd phalanges (p.f.)
L. astragalus
L. mandible P2P3P4M1M2M3
L. mandible frag. /M1M2/
hyoid frag.
2 x loose teeth

Cattle

L. radius proximal frag. (p.f.)
L. horn-core/cranium frag.

Pig

loose tooth

WH/A/3

Sheep

R. scapula frag.
1st phalange (p.f.)
2nd phalange (p.f.)
R. calcaneum (d.u.)
R. astragalus
L. astragalus
metapodial distal epiphysis (d.u.)
L. tibia proximal (p.f.)
R. tibia distal (d.u.)
L. tibia distal (d.u.)

L. mandible frag. /p3p4M1M2
 R. mandible frag. /M3
 L. mandible frag. p2p3/
 4 x loose teeth

Cattle

2 x loose teeth
 L. femur proximal frag. (p.u.)
 1st phalange proximal (p.f.)
 L. horn-core frag.

WH/A/5

Sheep

5 x loose teeth
 patella
 horn-core frag.
 R. metatarsal (p.f.,d.f.)
 metatarsal proximal frag.
 L. humerus (p.f.,d.f.)
 L. tibia proximal (p.f.)
 2 x L. tibia distal (d.f.)
 R. tibia (p.f.,d.f.)
 R. tibia (p.u.,d.u.)
 3 x carpals/tarsals
 2 x 1st phalanges (p.f.)
 2nd phalange (p.f.)
 3rd phalange
 L. astragalus
 R. astragalus
 R. mandible p2p3p4M1 (M1 erupting)
 R. mandible frag. - - P4/
 L. maxilla frag. -P3P4M1M2/ (periodontal decay)
 R. maxilla frag. -P3P4/

Cattle

loose tooth
 axis frag.
 carpal/tarsal
 2nd phalange (p.u.) (neonatal)
 L. ulna (p.u.) (")
 R. ulna (p.u.) (")
 3rd phalange
 L. metacarpal proximal (p.f.)
 metapodial distal (d.f.)
 L. innominate frag. (ilium)
 L. radius shaft frag.
 R. tibia shaft frag.

Pig

loose tooth
 L. maxilla frag. /- P4M1M2M3

R. astragalus
L. calcaneum (d.u.)

Bird
Nid frag.

Fish
vertebra - Euselachii sp.

WH/A/6

Sheep
atlas frag (neo-natal)
R. scapula proximal (p.f.)
L. scapula frag.
R. femur (p.u.,d.u.)
metatarsal shaft frag.
L. humerus shaft frag.

Cattle
L. tibia shaft frag.
3 x loose teeth
metatarsal distal (d.u.)

WH/A/9

Sheep
loose tooth
metatarsal shaft frag.

Cattle
2 x loose teeth
R. humerus shaft frag.
metapodial distal epiphysis (d.u.)

Pig
loose tooth

Red Deer
loose tooth

Dog
2 x R. metatarsal frags. - medium-sized dog

WH/A/10

Sheep
2 x loose teeth
2 x L. scapula (p.u.)
L. scapula (p.f.)
R. scapula frag.
R. astragalus

R. metatarsal (p.f.,d.u.)
R. tibia proximal (p.f.)
L. femur distal (d.u.)
radius shaft frag (chewed)
metapodial (p.u.,d.u.) (neo-natal)
R. mandible frag. p2p3p4M1/
L. mandible frag. P2P3P4M1M2M3
R. mandible frag. /M3
L. maxilla frag. /M/

Cattle

4 x loose teeth
2 x carpals/tarsals
1st phalange proximal (p.f.)
L. humerus (p.u.,d.u.)

WH/A/11

Sheep

R. radius shaft frag.
L. scapula frag.
R. tibia distal (d.f.)
R. astragalus
horn-core frag.

Cattle

2 x loose teeth

Seal

L. humerus (p.f.,d.f.) Halichoerus grypus (Grey Seal)

Bird

beak tip - Sula bassana (Gannet)

WH/A/13

Sheep

loose tooth
patella
metatarsal shaft frag.
R. humerus (p.u.,d.u.)

Cattle

metapodial shaft frag.

Pig

2 x loose teeth
2nd phalange frag.

WH/A/14

Sheep

metatarsal (p.f.,d.u.)
maxilla frag. /M/
carpal/tarsal
R. astragalus (burnt)
L. astragalus frag.
1st phalange distal (burnt)
metatarsal proximal frag. (p.f.) (burnt)
R. humerus distal (d.f.)

Cattle

3 x loose teeth
scapula proximal frag. (p.f.)
R. scapula proximal frag. (p.f.)
L. scapula frag.
carpal/tarsal (burnt)
L. maxilla frag. /p2p3p4/
metapodial distal frag. (burnt)
2nd phalange (p.u.,d.u.)

Pig

loose tooth

WH/A/16

Sheep

atlas
L. femur (p.u.,d.u.)
R. femur distal epiphysis (d.u.)
L. tibia (p.u.,d.u.)
R. tibia proximal (p.u.)
R. tibia distal (d.u.)
L. humerus (p.u.,d.u.)
R. humerus (p.u.,d.f.)
L. radius (p.f.,d.u.)
L. ulna (p.u.)
R. innominate frag. (ilium)
R. innominate frag. (ischium)
R. innominate frag. (pubis)
L. patella
R. patella
L. metacarpal (p.f.,d.u.)
R. metacarpal (p.f.,d.u.)
L. metatarsal (p.f.,d.u.)
R. metatarsal (p.f.,d.u.)
8 x 1st phalange (p.u.)
8 x 2nd phalange (p.u.)
6 x 3rd phalange
R. lateral malleolus
9 x carpals/tarsals
L. astragalus
R. astragalus

L. calcaneum (d.u.)
R. calcaneum (d.u.)

WH/A/18

Sheep

R. innominate
L. astragalus

Cattle

2 x loose teeth
1st phalange proximal (p.f.)
2nd phalange (p.u.) (neonatal)

WH/A/19

Sheep

L. scapula frag.
R. tibia shaft frag.
L. radius (p.f.,d.u.)

WH/A/19(1)

Sheep

loose tooth
tibia shaft frag.

Cattle

2 x loose teeth
3rd phalange (p.f.)

WH/A/19(2)

Cattle

loose tooth
L. astragalus

WH/A/20

Sheep

femur shaft frag.

Cattle

loose tooth

Fish

vertebra - Gadoid sp.

WH/A/21

Sheep

2 x loose teeth
L. tibia distal epiphysis (d.u.)

Cattle

R. humerus proximal (p.f.)
metapodial distal (d.u.)

Fish

Nid frag.

WH/A/24

Sheep

loose tooth
carpal
hyoid frag.

WH/A/26

Sheep

loose tooth	
L. radius distal (d.u.)	(burnt)
L. ulna frag.	(")
R. calcaneum distal (d.f.)	(")
metatarsal shaft frag.	(")

Cattle

2 x loose teeth
atlas frag.
3rd phalange
2 x L. astragalus
sesamoid
R. scapula (p.u.)

Pig

loose tooth

WH/A/38

Sheep

metacarpal shaft frag.
metatarsal shaft frag.

Cattle

5 x loose teeth
R. scapula (p.f.)

Pig

loose tooth

WH/A/43

Sheep

R. calcaneum (d.f.)
R. ulna proximal (p.f.)

Cattle

2 x loose teeth
2nd phalange (p.u.)

Pig

loose tooth

WH/A/52

Sheep

2 x loose teeth
R. innominate
R. humerus distal (d.f.)
L. metatarsal proximal (p.f.)
L. radius shaft frag.
1st phalange (p.f.)
carpal

Cattle

R. humerus proximal (p.u.)
tibia proximal epiphysis (p.u.)
1st phalange proximal (p.f.)
L. maxilla frag. /M1/

Pig

loose tooth

Horse

rib frag.

WH/A/54

Sheep

L. scapula (p.f.)
R. humerus (p.f.,d.f.)
L. radius shaft frag.
L. metacarpal proximal (p.f.)
R. femur distal epiphysis (d.u.)
L. calcaneum (d.f.)
1st phalange (p.f.)

Cattle

7 x loose teeth
R. calcaneum frag.
R. ulna frag.

L. metatarsal proximal (p.f.)
L. innominate frag. (pubis)
2nd phalange proximal (p.u.)

Dog

canine tooth - large dog

WH/A/55,56,57

Sheep

2 x loose teeth
axis
tibia shaft frag.

Cattle

8 x loose teeth
L. scapula frag. (p.f.)
1st phalange distal frag.
L. humerus distal (d.f.)
L. humerus shaft frag.

Pig

loose tooth

Bird

tarsometatarsus proximal Gavia stellata (Red-throated Diver)

WH/A/58

Sheep

loose tooth
metapodial distal frag. (d.u.)
R. mandible - p3p4M1M2
R. maxilla frag. /M1M2

Cattle

R. innominate frag. (ilium)
R. calcaneum frag.

Red Deer

L. innominate frag. (pubis)

Bird

coracoid frag. - large gull cf. Greater Black Back Gull

WH/A/61

Sheep

2 x loose teeth
R. tibia shaft frag.
R. tibia (p.u.,d.u.)
R. radius proximal (p.f.)

R. radius distal epiphysis (d.u.)
L. metacarpal (p.f.,d.u.)
R. metacarpal (p.f.,d.u.)
L. metatarsal (p.f.,d.u.)
R. metatarsal (p.f.,d.u.)
L. innominate frag. (ilium)
L. innominate frag. (pubis)
R. innominate frag. (ilium)
6 x 1st phalanges (p.u.)
2nd phalange (p.u.)
4 x carpals/tarsals
R. astragalus
R. calcaneum (d.u.)
R. maxilla frag. /MM/
horn-core frag.

WH/A/63

Sheep

atlas
axis (burnt)
L. scapula (p.f.)
L. astragalus
R. astragalus
L. tibia distal (d.f.)
R. tibia distal (d.f.)
L. metacarpal (p.f.,d.f.)
metacarpal distal (d.f.)
metatarsal proximal frag. (p.f.) (burnt)
R. calcaneum (d.f.)
L. innominate frag. (ilium)
R. innominate frag. (pubis) (burnt)
L. mandible frag. - p3p4M1M2/
L. mandible - P3P4M1M2M3
R. maxilla P2P3P4M1M2M3

WH/A/65

Sheep

2 x loose teeth
R. maxilla frag. /P4M1/
tibia distal frag. (d.f.)

Cattle

metapodial shaft frag.
L. calcaneum frag.
R. ulna frag.

WH/A/68

Sheep

R. maxilla frag. /M1M2M3

R. radius frag. (p.f.)
 R. tibia shaft frag.
 metatarsal shaft frag.
 L. tibia shaft frag.

Cattle

loose tooth
 R. scapula (p.f.) (WORKED)
 2nd phalange (p.f.)

WH/A/69

Sheep

loose tooth
 atlas
 axis
 skull frags.
 R. horn-core frag.
 L. maxilla P2P3P4M1M2M3
 R. maxilla P2P3P4M1M2M3

WH/A/70

Sheep

2 x loose teeth
 3 x horn-cores
 L. maxilla P2P3P4M1M2M3 (M3 erupting)
 R. maxilla P2p3P4M1M2M3 (")
 L. maxilla frag. /P4M1/
 R. maxilla frag. P2P3P4M1/
 L. mandible - - - M1M2M3
 R. mandible P2P3P4M1M2M3
 L. maxilla frag. P2P3/
 L. mandible frag. p2p3p4/
 R. mandible frag. - p3- /
 2 x L. scapula (p.f.)
 R. scapula (p.f.)
 R. scapula frag.
 sacrum (fused)
 sacrum (unfused)
 atlas (unfused)
 L. humerus (p.f.,d.f.)
 2 x L. humerus (p.u.,d.u.)
 R. humerus (p.f.,d.f.)
 R. humerus (p.u.,d.u.)
 L. radius (p.f.,d.f.)
 R. radius (p.f.,d.f.)
 L. radius (p.u.,d.u.)
 R. radius (p.u.,d.u.)
 2 x L. ulna (p.u.)
 R. ulna (p.u.)
 R. ulna (p.f.)
 2 x L. tibia (p.u.,d.u.)

L. tibia distal (d.f.)
 R. tibia proximal (p.u.)
 R. tibia proximal (p.f.)
 R. tibia distal (d.f.)
 R. tibia distal (d.u.)
 4x L. tibia (p.u.,d.u.)
 L. tibia proximal (p.u.)
 L. tibia distal (d.f.)
 R. tibia (p.f.,d.f.)
 R. tibia (p.u.,d.u.)
 R. tibia proximal (p.u.)
 R. lateral malleolus
 L. metacarpal (p.f.,d.f.)
 R. metacarpal (p.f.,d.f.)
 L. metacarpal (p.f.,d.u.)
 R. metacarpal (p.f.,d.u.)
 L. metatarsal (p.f.,d.f.)
 R. metatarsal proximal (p.f.)
 L. metatarsal (p.f.,d.u.)
 R. metatarsal (p.f.,d.u.)
 3 x carpals/tarsals
 5 x 1st phalange (p.f.)
 2 x 1st phalange (p.u.)
 2nd phalange (p.f.)
 2nd phalange (p.u.)
 3 x astragalus
 L. calcaneum (d.f.)
 L. calcaneum (d.u.)
 2 x R. calcaneum (d.u.)
 R. calcaneum (d.f.)
 9 x innominate frags.

Cattle

metapodial distal (d.u.)
 2nd phalange (p.u.) (neonatal)
 metaopodial distal epiphysis (d.u.)
 L. humerus distal epiphysis (d.u.)

WH/A/71

Sheep

3 x L. scapula (p.f.)
 L. humerus (p.fusing,d.f.)
 R. humerus distal (d.f.)
 R. femur proximal (p.f.)
 L. femur proximal (p.f.)
 L. tibia proximal (p.u.)
 R. radius (p.f.,d.u.)
 L. radius (p.f.,d.u.)
 L. innominate frag. (ilium/ischium)
 L. innominate frag. (ilium/pubis)
 L. astragalus

Cattle

3 x loose teeth
2nd phalange (p.u.)
lateral malleolus

Pig

loose tooth

Whale

part of hind end of neural arch of lumbar vertebra of a
Balaenoptera musculus (Blue Whale)

WH/A/75

Cattle

loose tooth
L. scapula proximal (p.f.)
L. humerus distal (d.f.)

WH/A/78

Sheep

24 x loose teeth
axis (caudal u.)
R. radius proximal (p.f.)
L. humerus (p.f.,d.f.)
R. tibia (p.u.,d.u.)
R. metacarpal (p.f.,d.u.)
R. metacarpal (p.f.,d.f.)
2 x R. metacarpal proximal (p.f.)
L. metacarpal distal (d.u.)
R. metatarsal (p.f.,d.f.)
L. metatarsal (p.f.,d.f.)
R. metatarsal (p.f.,d.u.)
L. metatarsal (p.f.,d.u.)
R. metatarsal proximal (p.f.)
metapodial distal (d.u.)
metapodial distal frag. (d.f.)
18 x 1st phalanges (p.f.)
4 x 2nd phalanges (p.f.)
3rd phalange (p.f.)
2 x R. astragalus
R. calcaneum (d.u.)
3 x carpals
R. horn-core
2 x L. maxilla frag. P2P3p4/
L. maxilla frag. /M1M2M3
2 x L. maxilla frag. /M1M2

Cattle

4 x loose teeth
tibia shaft frag.

WH/A/80

Sheep

axis (caudal u.)

loose tooth

L. scapula frag.

metacarpal shaft frag.

Cattle

loose tooth

tibia shaft frag.

metatarsal proximal frag. (p.f.)

carpal

metapodial shaft frag.

Pig

loose tooth

L. scapula proximal (p.f.)

L. radius proximal (p.f.)

L. ulna (p.u.,d.u.)

R. mandible frag. /m2m3M1

Whale

fragments, possibly from the ventral surface of a caudal vertebra of a Balaenoptera musculus (Blue Whale)

Bird

Nid frag.

WH/A/84

Cattle

loose tooth

WH/A/85

Sheep

loose tooth

R. tibia shaft frag.

L. innominate frag. (ilium)

Cattle

loose tooth

R. mandible frag.

Red Deer

L. humerus distal (d.f.)

WH/A/86

Sheep

1st phalange (p.u.)

L. mandible frag. -p3p4/

Cattle

metatarsal distal (d.u.)

WH/A/90

Sheep

loose tooth

atlas

2 x L. femur distal epiphysis (d.u.)

L. metatarsal (p.f.,d.u.)

2 x sesamoids

2 x R. mandible frag.

L. mandible frag.

Cattle

3 x loose teeth

R. scapula frag.

R. innominate frag. (ilium)

Pig

2 x loose teeth

skull frag.

Dog

loose tooth

WH/A/92

Sheep

L. scapula frag.

Cattle

loose tooth

patella frag. (burnt)

WH/A/96

Sheep

L. scapula frag.

R. metacarpal (p.f.,d.f.)

3rd phalange

L. tibia shaft frag.

R. ulna (p.u.)

R. tibia proximal epiphysis (p.u.)

metapodial proximal frag. (p.u.)

Cattle
scapula frag.

Pig
loose tooth

WH/A/97

Sheep
R. scapula (p.f.)
L. radius frag.
R. innominate frag. (acetabulum/ischium) (unfused)

Pig
R. calcaneum (d.u.)

WH/A/98

Sheep
R. tibia proximal (p.f.)
R. tibia distal (d.f.)
L. radius shaft frag.
L. humerus distal (d.f.)
L. ulna (p.f.)
L. radius proximal (p.f.)
R. femur distal (d.u.)
L. humerus proximal (p.u.)
R. astragalus
R. calcaneum (d.f.)
2 x carpals
R. mandible frag. p2p3p4/

Cattle
3 x loose teeth
L. scapula frag.
2 x cranium frags.
L. innominate frag. (acetabulum) (fused)
R. mandible frag. p2p3p4M1/

WH/A/100

Sheep
R. humerus distal (d.f.)
R. metatarsal proximal (p.f.)
metatarsal distal (d.f.)
metatarsal shaft frag.

Red Deer
R. radius proximal (p.f.)
L. humerus distal (d.u.)

WH/A/102

Sheep

loose tooth
carpal
1st phalange (p.u.)

Cattle

2 x loose teeth

Pig

2 x loose teeth

A 22/5

Sheep

L. humerus shaft frag.
humerus shaft frag.
L. femur distal epiphysis (d.u.)
L. tibia proximal epiphysis (p.u.)
R. metacarpal proximal (p.f.) (burnt)
metatarsal shaft frag.

Cattle

3 x loose teeth
horn-core frag.
L. calcaneum (d.u.)
L. mandible p2p3p4
R. tibia proximal (p.f.)
metapodial distal epiphysis (d.u.)
L. astragalus (neonatal)
L. innominate frag. (ilium)
3rd phalange

Pig

R. astragalus (burnt)
scapula proximal frag. (p.u.)
R. metacarpal IV (p.f.,d.u.)

Fish

Nid frag.

A 22/6

Sheep

3 x loose teeth
L. humerus proximal frag. (p.u.)
R. humerus proximal frag. (p.u.)
R. humerus distal (d.f.)
R. scapula frag.
atlas frag.
L. tibia distal (d.f.) (chewed)
metatarsal shaft frag. (burnt)

Cattle

2 x loose teeth

R. femur distal frag. (d.f.)

skull frag.

metapodial shaft frag.

Bird

2 bones of Alca impennis (Great Auk)

Whale

Nid frag.

A 22/11 wall and structure

Cattle

tooth frags.

A 22/17,18

Sheep

2 x loose teeth

metatarsal distal frag. (d.f.) (burnt)

R. innominate frag. (acetabulum)

L. innominate frag. (ischium)

L. calcaneum frag. (d.u.) (burnt)

metatarsal shaft frag.

R. humerus distal (d.u.)

Cattle

3 x loose teeth

R. maxilla frag. /P4M1M2/

carpal

R. scapula frag. (p.f.)

metapodial shaft frag.

metatarsal shaft frag.

R. innominate frag. (ischium) (neonatal)

Pig

loose tooth

A 22/17,18,19,21

Sheep

loose tooth

R. mandible P2P3P4M1M2M3

R. mandible frag. - P3-/

2 x R. radius shaft frags.

R. humerus distal (d.f.) (chewed)

R. calcaneum frag. (d.u.)

1st phalange (p.f.)

1st phalange (p.u.)
L. humerus (p.u.,d.u.)

Cattle

5 x loose teeth
L. tibia distal (d.f.)
metapodial proximal frag. (p.u.) (neonatal)
2nd phalange (p.u.) (")
3rd phalange (p.u.) (")
R. radius proximal (p.u.) (")
L. ulna (p.u.) (")

A 22/12/4

Sheep

1st phalange (p.f.)

Cattle

loose tooth
2nd phalange (p.u.) (neonatal)
ulna distal epiphysis (d.u.0

A 22 SW

Sheep

5 x loose teeth
L. radius proximal (p.f.) (chewed)
L. radius proximal (p.f.)
L. radius distal (d.f.)
R. radius shaft frag.
L. femur proximal (p.u.)
L. humerus (p.u.,d.u.)
L. tibia (p.u.,d.u.)
R. tibia distal (d.f.)
1st phalange (p.u.)
L. metatarsal (p.f.,d.f.)
metapodial distal (d.f.)

Cattle

12 x loose teeth
2 x carpals
L. scapula frag. (p.f.)
R. scapula frag. (p.u.) (neonatal)
radius proximal epiphysis (p.u.) (")
tibia proximal epiphysis (p.u.) (")
L. lateral malleolus
L. femur shaft frag.
1st phalange distal frag.

Pig

3 x loose teeth
1st phalange (p.u.)

L. calcaneum (d.u.)
metapodial distal epiphysis (d.u.)

Whale
Nid frag.

A 22 S/7

Sheep
1st phalange (p.f.)
R. tibia shaft frag.

Cattle
8 x loose teeth
L. mandible frag. p2p3-/
2nd phalange (p.f.)

Pig
L. calcaneum frag.

Seal
loose tooth Halichoerus grypus (Grey Seal)

Whale
Nid frag.

A 22 S/11

Sheep
2 x loose teeth
L. metatarsal proximal
R. scapula (p.f.)
L. innominate frag. (ischium)

Cattle
loose tooth
1st phalange proximal (p.f.)

A 22 E/2

Sheep
loose tooth

A 23/3

Sheep
5 x loose teeth
L. mandible frag. - P3P4M1/
sacrum
L. femur (p.f.,d.f.)
L. tibia proximal (p.u.)

L. tibia shaft frag. (burnt)
tibia shaft frag.
R. tibia proximal (p.f.)
L. radius proximal (p.f.)
L. humerus proximal (p.f.) (burnt)
R. humerus distal (d.f.)
L. humerus shaft frag.
metapodial distal (d.f.)
L. calcaneum (d.f.)
R. innominate
2 x R. innominate frag. (ilium/ischium)
R. innominate frag. (ilium)

Cattle

4 x loose teeth
L. scapula (p.f.)
horn-core frag.
L. tibia proximal epiphysis (p.u.)
L. tibia distal (d.f.)
L. radius distal (d.fusing)
carpal
2nd phalange (p.u.) (neonatal)
R. femur shaft frag.

Pig

loose tooth
L. mandible frag. /p4M1M2
R. maxilla frag. /- M1-/

Bird

Nid frag.

A 23 W+/2

Sheep

loose tooth

Cattle

R. lateral malleolus
R. metatarsal proximal frag. (p.f.)
metatarsal proximal frag. (p.f.)
metapodial proximal frag. (p.f.)

A 23 W+baulk/1

Sheep

R. radius distal (d.f.)

A 23/33

Sheep

loose tooth

R. tibia shaft frag.
R. tibia distal (d.u.)
metacarpal shaft frag. (burnt)

Cattle

3rd phalange
L. astragalus
L. humerus distal (d.f.)

A 03/E(1/3)/1

Sheep

3 x loose teeth
horn-core frag.
L. scapula (p.f.)
2 x R. scapula (p.u.)
L. ulna frag.
R. innominate frag. (ischium) (burnt)
metatarsal (p.u.,d.u.) (neonatal)
tibia distal (d.u.) (")
1st phalange (p.u.)
metatarsal shaft frag.

Cattle

2 x loose teeth
horn-core frag.
R. mandible frag. /M3
femur proximal epiphysis (p.u.)
2nd phalange distal
3rd phalange
carpal
metatarsal proximal (p.u.) (neonatal)
L. tibia distal frag. (d.f.)

Fish

3 x Nid frags.

PRE-WHEELHOUSE B MIDDEN SAMPLES

A 33 E/1

Cattle

metapodial shaft frag. (immature)
carpal

WB 13/4

Sheep

L. calcaneum (d.f.)
L. calcaneum frag.

L. metatarsal proximal frag. (p.f.)
1st phalange (p.u.)
L. maxilla frag. /M1M2
3 x loose teeth

Cattle

L. radius proximal frag. (p.f.) (burnt)
loose tooth
skull frag.

Pig

fibula proximal frag. (p.u.)

Red Deer

R. calcaneum (p.f.)

Whale

Nid frag.

WB 13/5

Sheep

L. calcaneum (d.u.)

Cattle

3 x carpals
3rd phalange
loose tooth

WB 13/6

Sheep

axis

L. patella

Cattle

1st phalange (p.f.)
loose tooth

Pig

1st phalange (p.u.)
2nd phalange (p.u.)

WB 13/7

Sheep

skull frag.
R. humerus (p.f., d.f.)
sacral frag. (unfused)
R. femur distal epiphysis (d.u.)
1st phalange (p.u.)

R. tibia shaft frag.
R. innominate frag. (acetabulum/ischium) (unfused)
loose tooth

Cattle

11 x loose teeth
R. horn-core
skull frag.
R. scapula proximal frag. (p.f.)
L. femur distal (d.f.)
2nd phalange (p.f.)
axis frag.

Red Deer

R. scapula proximal (p.f.)
R. scapula frag.

Bird

humerus - Turdus pilaris (Fieldfare)
humerus frag. - Fulmaris glacialis (Fulmar petrel)

Whale

Nid frag.

WB 13/8

Sheep

sternal frag. (unfused)
R. radius shaft frag. (chewed)
R. innominate frag. (ilium)

Cattle

2 x loose teeth
axis
L. scapula frag. (chewed)
L. innominate frag. (ilium)
3rd phalange (p.u.)
R. mandible frag. p2p3p4/
R. scapula (p.f.)
L. radius (p.f.,d.u.)
L. ulna (p.u.)
L. humerus (p.u.,d.f.)
carpal
R. maxilla frag /p4M1M2/

Bird

Nid frag.

Whale

Nid frag.

WB 35/1

Cattle

5 x loose teeth

Pig

R. radius distal (d.u.)

WB 35/2

Sheep

L. calcaneum (p.u.)

Cattle

femur proximal frag. (p.u.)

2 x loose teeth

R. metacarpal proximal frag. (p.f.)

astragalus frag.

R. mandible frag.

Pig

R. calcaneum (d.u.)

WB 35/3

Sheep

8 x loose teeth

R. radius distal epiphysis (d.u.)

2 x 1st phalanges (p.f.)

sesamoid

R. innominate frag. (acetabulum/ilium)

L. innominate frag. (acetabulum)

Cattle

3 x loose teeth

L. horn-core and skull frags.

L. metacarpal proximal frag. (p.f.)

2 x L. calcaneum frag.

tarsal

1st phalange (p.f.)

2nd phalange (p.f.)

3rd phalange

sesamoid

Pig

loose tooth

Red Deer

L. astragalus

WB 35/4

Sheep

loose tooth

Cattle

vertebra frag.

Whale

possibly frag. of radius/ulna from large whale cf. Balaenoptera musculus (Blue Whale)

WB 35/5

Sheep

loose tooth

metatarsal distal (d.f.)

L. astragalus

R. maxilla frag. /M2M3

Cattle

3 x loose teeth

3rd phalange

horn-core frag.

sesamoid

metapodial distal frag. (d.f.)

R. humerus distal (d.f.)

Pig

loose tooth

Horse

R. humerus (p.f.) (appears recent?)

WB SC/3

Sheep

loose tooth

L. scapula (p.f.)

Cattle

loose tooth

R. innominate frag. (acetabulum/ilium)

L. metatarsal proximal (p.f.) (chewed)

metacarpal distal (d.f.)

2 x 2nd phalange (p.f.)

3rd phalange

2 x L. mandible frag.

mandible frag.

Whale

Nid frag.

WB SC/4

Sheep

L. mandible p2p3p4M1
L. radius shaft
R. radius proximal (p.f.)
2 x metapodial distal (d.u.)
R. innominate frag. (ilium/ischium) (fused)

WB ES/3

Sheep

2 x loose teeth
axis (unfused)
L. tibia shaft frag.
L. mandible frag. /M1M2M3 (M3 erupting)

Cattle

6 x loose teeth
R. scapula frag.
L. radius distal frag. (d.f.)
L. astragalus

Pig

2 x loose teeth

WB ES/4

Sheep

L. calcaneum (p.u.)

Cattle

3 x loose teeth
R. horn-core frag.
metacarpal shaft frag.

WB ES/5

Sheep

3 x loose teeth
metacarpal shaft frag.
metatarsal shaft frag.

Cattle

metapodial distal (d.f.)
metacarpal shaft frag.
R. radius proximal epiphysis (p.u.)
2 x carpals
L. innominate frag.
L. mandible frag. p2p3p4M1 (M1 erupting)

Bird

2 bones of Fulmaris glacialis (Fulmar Petrel)

WB EN/2

Sheep

loose tooth

R. calcaneum (d.f.)

metapodial proximal frag. (p.u.)

R. horn-core frag.

L. mandible frag. -P3P4M1M2/

Cattle

7 x loose teeth

L. scapula frag.

metacarpal shaft frag.

R. metacarpal proximal frag. (p.f.)

R. innominate frag. (ischium)

L. metatarsal distal (d.u.)

3rd phalange

3 x carpals

Pig

2 x 1st phalange (p.u.)

L. humerus distal (d.f.)

Red Deer

L. femur shaft frag.

WB EN/3

Nid frag. only

WB EN/4

Sheep

2 x loose teeth

L. scapula frag.

L. radius/ulna distal (d.f.)

1st phalange (p.f.)

L. innominate frag. (acetabulum/ischium)

L. horn-core

Cattle

8 x loose teeth

L. scapula proximal (p.f.)

humerus proximal frag. (p.f.)

L. humerus distal (d.f.)

L. femur proximal (p.f.)

axis frag.

L. tibia proximal frag. (p.u.)

R. radius (p.u.,d.u.)

L. metacarpal proximal frag. (p.f.)
R. metacarpal proximal frag. (p.f.)
R. innominate frag. (acetabulum/pubis) (unfused)
2 x L. innominate frag. (acetabulum/ilium)
3rd phalange
carpal
L. horn-core frag.
skull frag.

Bird

beak frag. Sula bassana (Gannet)

WB EN/5

Nid frag. only

WB EN/7

Sheep

loose tooth
L. scapula frag.
R. radius (p.f.,d.u.)
metacarpal (p.u.,d.u.) (neonatal)
2 x R. femur proximal (p.u.)
R. femur distal frag. (d.u.)
L. tibia (p.u.,d.u.)
R. tibia shaft frag.
metatarsal shaft frag.
L. innominate frag. (acetabulum/ilium) (fused)

Cattle

3 x loose teeth
R. tibia distal (d.f.)
R. ulna frag.
R. innominate frag. (acetabulum/ilium)
R. metatarsal proximal (p.f.)
R. calcaneum frag.
carpal
R. innominate frag. (ischium) (unfused)
R. mandible frag. p2p3/

Pig

L. scapula (p.u.)
L. tibia shaft frag.

Whale

3 x frags. from head of large whale

WB 61/1 midden

Cattle

loose tooth

A/3 SE Quad.

Sheep

2 x loose teeth

Cattle

loose tooth

metatarsal distal (d.u.)

R. metacarpal proximal (p.f.)

L. scapula frag.

A/5 NW Quad. midden layers below floor

Nid only

A/6 SE Quad. midden below floor

Cattle

L. scapula proximal (p.f.)

1st phalange (p.f.)

S/2 souterrain cutting

Sheep

2 x loose teeth

R. mandible frag. /- M1M2M3

R. scapula (p.u.)

R. humerus distal (d.f.)

R. tibia proximal (p.f.)

L. tibia shaft frag.

2 x tibia distal frags. (d.u.) (1 burnt)

metatarsal shaft frag.

2 x metacarpal shaft frag.

R. radius (p.u.,d.u.0 (neonatal)

Cattle

3 x loose teeth

L. radius distal (d.f.)

L. astragalus (neonatal)

L. ulna frag. (")

R. calcaneum frag. (d.u.) (neonatal)

R. innominate frag. (ilium)

R. tibia shaft frag.

Pig

L. tibia proximal (p.fusing)

Whale

vertebra frag. - medium whale cf. Globicephala melaena (Pilot Whale)

nid frag.

S/4 souterrain cutting

Sheep

loose tooth

skull frag.

L. mandible frag. p2p3p4M1/

L. mandible frag. - P3-/

R. metatarsal (p.f.,df.) (chewed)

R. tibia proximal (p.u.)

L. tibia shaft frag.

R. tibia shaft frag.

Cattle

4 x loose teeth

R. radius proximal (p.f.)

L. radius (p.u.,d.u.)

R. calcaneum (d.u.)

R. ulna frag.

L. radius proximal frag. (p.f.)

metatarsal proximal frag. (p.f.)

metatarsal shaft frag.

metacarpal shaft frag.

R. innominate frag. (ischium) (unfused)

horn-core frag.

2 x L. horn-core/skull frags.

Pig

L. mandible frag. /p4M1-

L. metatarsal IV (p.f.,d.u.)

R. innominate frag. (ischium)

Fish

Nid frag.

Whale

Nid frag.

S/6 souterrain cutting

Sheep

2 x loose teeth

R. radius shaft frag.

R. ulna (p.u.)

1st phalange (p.f.)

R. humerus (p.u.,d.u.)

metatarsal shaft frag.

L. tibia proximal frag. (p.f.)

Cattle

horn-core frag.
L. scapula frag.
R. scapula frag.
L. humerus distal (d.u.)
metatarsal shaft frag.
L. femur distal (d.f.)
R. femur distal (d.f.)
femur proximal epiphysis (p.f.)
1st phalange proximal frag. (p.f.) (burnt)
2nd phalange (p.u.)
L. mandible frag. p2p3p4/
R. mandible frag. p2p3p4/
L. maxilla frag. /M3
3 x loose teeth

POST WHEELHOUSE B REFILL

WB 1323/1 13+23 east side [2] refill

Sheep

R. metacarpal proximal (p.f.)
L. metatarsal proximal (p.f.)
metatarsal distal (d.u.)
L. mandible frag. /p2p3p4/
tibia proximal epiphysis (p.u.)

Cattle

loose tooth
2 x carpals
L. astragalus
R. humerus distal (d.f.)
R. humerus shaft frag.
humerus proximal frag. (p.f.)
L. scapula (p.f.)
L. tibia proximal (p.f.)
metapodial frags. (d.u.)

Pig

loose tooth
R. humerus shaft frag.

Horse

loose tooth

1323/2 13+23 north side wheelhouse

Sheep

loose tooth
carpal
L. humerus distal (d.f.)

R. metatarsal proximal (p.f.)
L. horn-core

Cattle

4 x loose teeth
L. calcaneum (d.f.)
R. ulna (p.u.) (neonatal)
R. ulna frag.
R. calcaneum (d.u.) (neonatal)
R. tibia proximal (p.u.)
L. tibia proximal (p.u.)
1st phalange (p.f.)
L. astragalus (neonatal)
R. humerus distal (d.f.)

Red Deer

1st phalange (p.f.)

Bird

ulna - Corvus sp. - between a Raven and a crow in size
Nid frag. (chewed)

13/1 WH[2] refill

Sheep

L. innominate frag. (ilium)
2nd phalange (p.f.)
R. maxilla p2p3p4M1M2 (M2 erupting)

Cattle

loose tooth
L. femur proximal (p.f.)
R. ulna frag.
R. humerus proximal frag. (p.f.)
R. scapula proximal (p.f.)

Horse

atlas

23/1 [2] refill

Sheep

R. innominate frag. (ilium)

Cattle

L. humerus distal (d.f.)

Cell A A/1 refill

Sheep

L. femur (p.u., d.u.)
L. ulna (p.u.)

R. innominate frag. (ilium/ischium)
R. tibia proximal (p.u.)
L. metacarpal (p.f.,d.u.)

Cattle

6 x loose teeth
L. scapula (p.f.)
L. skull/horn-core frags.
L. innominate frag. (ilium)
R. femur distal (d.f.)
R. astragalus
R. astragalus frag.

Pig

2 x loose teeth
R. mandible C--p3p4M1M2M3

Identification of the faunal remains from Northton, Harris.

Neolithic.

Sheep.

195 x loose teeth
horn-core frags.
skull frags.
L. scapula (p.f.)
2 x L. scapula (p.u.) (neo-natal)
R. scapula frag.
4 x scapula (p.u.) (neo-natal)
R. innominate frag. (acetabulum)
2 x R. innominate frag. (ischium)
R. innominate frag. (ilium)
4 x R. innominate frags. (pubis)
R. innominate frag. (ilium/ischium)
2 x L. innominate frag. (acetabulum)
L. innominate frag.
3 x L. innominate frag. (ilium/ischium)
3 x L. innominate frag. (ilium)
4 x L. ulna (p.f.)
L. ulna (p.u.) (neo-natal)
R. ulna (p.f.)
4 x R. ulna (p.u.) (neo-natal)
3 x radius shaft frags.
L. radius proximal (p.f.)
L. radius distal (d.f.)
3 x L. radius shaft frags.
7 x L. radius (p.u.,d.u.) (neo-natal)
R. radius (p.u.,d.u.)
5 x R. radius proximal (p.f.)
3 x R. radius shaft frags.
3 x R. radius proximal (p.u.) (neo-natal)
2 x femur proximal frags. (p.f.)
L. femur (p.u.,d.u.) (neo-natal)
L. femur shaft frag.
R. femur proximal (p.f.)
5 x femur (p.u.,d.u.)
R. femur (p.u.,d.u.) (neo-natal)
7 x L. humerus distal (d.f.)
L. humerus distal frag.
L. humerus distal (d.u.)
L. humerus shaft frag.
L. humerus shaft frag. (neo-natal)
L. humerus distal (d.u.) (neo-natal)
R. humerus distal (d.u.) (neo-natal)
R. humerus proximal frag. (p.f.)
2 x R. humerus distal (d.f.)
4 x R. humerus shaft frag.
L. tibia proximal (p.u.)
9 x L. tibia shaft frags.
2 x L. tibia distal (d.u.)
2 x R. tibia shaft frags.

3 x R. tibia distal (d.f.)
 R. tibia distal (d.u.)
 L. radius proximal (p.f.)
 2 x metapodial (d.u.) (neo-natal)
 4 x metapodial distal (d.u.)
 metapodial distal (d.f.)
 R. metacarpal proximal (p.f.)
 3 x L. metacarpal proximal (p.f.)
 L. metacarpal proximal (p.u.) (neo-natal)
 metacarpal distal (d.u.)
 7 x metacarpal shaft frags.
 3 x L. metatarsal proximal (p.f.)
 2 x R. metatarsal proximal (p.f.)
 R. metatarsal (p.f.,d.f.)
 metatarsal distal (d.f.)
 2 x metatarsal distal (d.u.)
 9 x metatarsal shaft frags.
 4 x carpals/tarsals
 6 x 1st phalange (p.f.)
 2 x 2nd phalange (p.f.)
 2 x 3rd phalange (p.f.)
 4 x L. astragalus
 5 x R. astragalus
 4 x L. calcaneum
 R. calcaneum frag.
 R. calcaneum (d.u.)
 R. calcaneum (d.f.)
 L. mandible frag. -P3P4/
 L. mandible frag. -p3p4M1/
 L. mandible frag. p2p3/
 L. mandible frag. P2P3P4M1/
 L. mandible frag. P3P4M1/ (slight periodontal decay)
 L. mandible frag. - -P4M1/
 L. mandible frag. P2P3P4/ (P2 still erupting)
 L. mandible frag. /M/ (erupting)
 L. mandible frag. /M2M3
 L. mandible frag. /M/
 L. mandible frag. p2p3p4M1/
 R. mandible frag. p2p3/
 R. mandible frag. p2p3/
 R. mandible frag. p2p3/
 R. mandible frag. -p3p4/
 R. mandible frag. -p3p4/
 R. mandible frag. -p3/
 R. mandible frag. -P3/
 R. mandible frag. p2p3-/
 R. mandible frag. CP2P3/ (P2 still erupting)
 R. mandible frag. -P3P4M1M2/
 R. mandible frag. /P4M1
 R. mandible frag. /P4/ (erupting)
 R. mandible frag. /M2M3
 L. maxilla frag. P2P3P4M1M2/ (P4 twisted in socket)
 L. maxilla frag. -P3/
 L. maxilla frag. /P3P4M1
 L. maxilla frag. /P3P4M1M2

L. maxilla frag. -P3P4/
maxilla frag. /MM/
5 x maxilla frags. /M/

Cattle.

4 x L. scapula (p.f.)
L. scapula (p.u.)
L. scapula frag. (chewed)
R. scapula frag.
R. scapula (p.u.)
R. humerus distal (d.f.)
L. radius proximal (p.f.)
L. radius distal (d.f.)
R. tibia distal (d.u.)
femur proximal frag. (p.u.)
L. femur shaft frag.
L. femur proximal (p.u.)
L. femur distal (d.u.)
L. femur (p.u.,d.u.) (neo-natal)
R. femur proximal (p.u.)
R. ulna (p.u.) (neo-natal)
L. ulna frag.
horn-core frags.
R. metacarpal proximal (p.f.)
metacarpal distal (d.u.)
metapodial distal (d.f.)
metapodial shaft frags.
L. metatarsal proximal frag. (p.f.)
R. metatarsal proximal frag. (p.f.)
L. metatarsal proximal (p.f.) (neo-natal)
metatarsal shaft frag.
L. innominate frag. (ilium)
L. innominate frag. (ischium)
2 x R. innominate frags. (ilium)
R. innominate frag. (ischium)
7 x carpals/tarsals
R. calcaneum (d.u.)
R. calcaneum (d.u.) (neo-natal)
2 x R. calcaneum frag.
1st phalange (p.f.) (burnt)
7 x 1st phalange (p.f.)
2nd phalange (p.f.) (burnt)
3 x 2nd phalange (p.f.)
2 x 2nd phalange frags.
116 x loose teeth
L. mandible frag. /MM/
R. mandible frag. p2p3p4/
R. mandible frag. /p3p4M1
R. mandible frag. /M/

Pig

loose tooth (tusk - possibly wild boar)

Red Deer.

6 x loose teeth

R. maxilla frag. /MM/
L. scapula proximal (p.f.)
R. scapula (p.u.) (neo-natal)
L. humerus shaft frag.
R. humerus distal frag. (d.u.)
R. radius proximal frag. (p.f.)
L. metacarpal proximal (p.f.)
3 x metatarsal shaft frag.
metapodial distal (d.f.)
L. calcaneum (d.f.)
L. astragalus
R. astragalus
1st phalange proximal (p.f.)
1st phalange frag. (p.u.)
2nd phalange (p.f.)
2nd phalange (p.u.)

Seal..

3 x teeth
2 x phalange frags.
L. radius proximal (p.u.)
L. scapula frag. (p.f.) Common Seal (PHOCA VITULINA)

Lagomorphs.

A few bones of rabbit (ORYCTOLAGUS CUNICULUS) and of hare (LEPUS TIMIDUS).

Fish.

A few unidentifiable scraps and a premaxillary of a Conger Eel (CONGER CONGER).

Birds.

A few bones (at most) of:

Gannet	(<u>SULA BASSANA</u>)
Shag	(<u>PHALACROCORAX ARISTOTELIS</u>)
Puffin	(<u>FRATERCULA ARCTICA</u>)
Guillemot	(<u>URIA AALGE</u>)
Herring Gull	(<u>LARUS ARGENTATUS</u>)
Blackbird	(<u>TURDUS MERULA</u>)
Redshank	(<u>TRINGA TOTANUS</u>)

Beaker VII.

Sheep.

97 x loose teeth
2 x R. scapula frag. (p.f.)
L. scapula frag. (p.f.)
2 x L. scapula frag.
horn-core frags.
2 x R. ulna frag.
2 x L. humerus distal (d.f.)
2 x R. humerus distal (d.f.)

R. humerus shaft frag.
 2 x L. femur shaft frag.
 R. femur shaft frag.
 L. radius proximal (p.f.)
 2 x L. radius shaft frags.
 L. radius/ulna shaft frag.
 L. radius proximal (p.u.)
 2 x R. radius shaft frags.
 R. radius/ulna shaft frag.
 L. tibia distal (d.u.)
 L. tibia distal (d.f.)
 3 x L. tibia shaft frag.
 5 x R. tibia shaft frag.
 2 x R. tibia proximal (p.u.) (neo-natal)
 R. tibia distal (d.f.)
 L. innominate frag. (ischium)
 2 x L. innominate frag. (ilium)
 L. innominate frag. (pubis)
 R. innominate frag. (pubis)
 L. metacarpal (p.f.,d.u.)
 L. metacarpal proximal (p.f.)
 3 x R. metacarpal proximal (p.f.)
 2 x metacarpal shaft frags.
 L. metatarsal (p.f.,d.u.)
 L. metatarsal proximal (p.f.)
 metatarsal proximal (p.u.) (neo-natal)
 metatarsal distal (d.f.)
 5 x metatarsal shaft frags.
 metapodial proximal frag. (p.f.)
 metapodial distal (d.f.)
 metapodial shaft frag.
 1st phalange (p.u.)
 5 x 1st phalange distal
 2 x 2nd phalange (p.f.)
 2 x 3rd phalange (p.u.) (neo-natal)
 3rd phalange (p.f.)
 2 x L. patella
 R. patella
 10 x carpals/tarsals
 2 x L. astragalus
 3 x R. astragalus
 R. astragalus (neo-natal)
 R. calcaneum (d.f.)
 L. mandible -P3P4M1M2M3 (crowding of premolars)
 L. mandible -p3p4M1
 L. mandible frag. p2p3p4M1/
 L. mandible frag. /M2M3
 L. mandible frag. p2p3/
 L. mandible frag. p2/
 R. mandible -P3P4M1M2M3
 R. mandible frag. -p3/
 L. maxilla frag. /MM/
 R. maxilla frag. P2P3P4M1/
 R. maxilla frag. /M3

Cattle.

122 x loose teeth
2 x L. scapula (p.f.)
L. scapula frag.
R. scapula (p.f.)
R. scapula (p.u.) (neo-natal)
L. ulna (p.f.)
2 x L. ulna frag.
L. ulna frag. (neo-natal)
R. ulna frag.
L. innominate frag. (ischium)
R. innominate frag. (ilium)
R. innominate frag. (ischium)
R. innominate frag. (pubis)
R. femur shaft frag.
2 x L. tibia distal (d.u.)
2 x R. tibia proximal (p.u.)
R. tibia distal epiphysis (d.u.)
R. tibia shaft frag.
R. lateral malleolus
2 x L. radius proximal frag. (p.f.)
8 x carpals/tarsals
L. astragalus (neo-natal)
R. astragalus
R. calcaneum (d.f.)
2 x R. calcaneum frag.
1st phalange (p.f.)
1st phalange (p.u.)
1st phalange (p.u.,d.u.) (neo-natal)
6 x 1st phalange proximal (p.f.)
1st phalange proximal (p.f.) (chewed)
3 x 1st phalange distal
2nd phalange (p.fusing)
2nd phalange (p.f.)
2 x 2nd phalange (p.u.,d.u.) (neo-natal)
2nd phalange (p.u.)
3 x 2nd phalange proximal (p.f.)
2nd phalange proximal epiphysis (p.u.)
2 x 2nd phalange distal
2 x 3rd phalange (p.f.)
3rd phalange (p.u.)
R. patella
3 x L. metacarpal proximal (p.f.)
2 x R. metacarpal proximal (p.f.)
2 x L. metatarsal proximal (p.f.)
2 x R. metatarsal proximal (p.f.)
metatarsal proximal frag. (p.f.)
metapodial proximal frag. (p.f.)
metapodial distal (d.f.)
2 x metapodial distal frag. (d.f.)
3 x metapodial distal epiphysis frag. (d.u.)
2 x metapodial shaft frag.
L. mandible frag. p2p3p4/
L. mandible frag. p2p3p4M1/
L. mandible frag. P2P3/

R. maxilla frag. -P3P4/
maxilla frag. /M/ (massive)
maxilla frag. /M/

Red Deer.

63 x loose teeth
L. humerus proximal (p.u.)
L. humerus distal (d.f.)
L. humerus distal frag. (d.f.) (chewed)
R. humerus distal (d.f.)
R. humerus distal frag. (d.f.) (chewed)
L. humerus shaft frag.
R. scapula (p.f.)
R. scapula frag. (p.f.)
3 x R. ulna (p.f.)
R. ulna frag.
L. ulna (p.f.)
2 x L. ulna frag.
L. radius proximal (p.f.)
3 x L. radius proximal frags. (p.f.)
2 x R. radius proximal (p.f.)
R. radius proximal frag. (p.f.)
R. radius distal (d.f.)
femur proximal epiphysis (p.u.)
L. femur distal (d.u.)
L. tibia shaft frag.
L. tibia distal (d.f.)
R. tibia distal (d.f.)
L. lateral malleolus
2 x R. lateral malleolus
L. calcaneum (d.f.)
L. calcaneum (d.u.)
R. calcaneum frag. (burnt)
3 x L. astragalus
R. astragalus
14 x carpals/tarsals
R. patella
R. innominate frag. (ilium)
L. innominate frag. (pubis)
L. innominate frag. (ilium/ischium/pubis)
4 x 1st phalange (p.f.)
11 x 1st phalange distal
5 x 1st phalange proximal (p.f.)
1st phalange proximal epiphysis (p.u.)
6 x 2nd phalange (p.f.)
3 x 2nd phalange distal
2 x 2nd phalange proximal (p.f.)
2 x 3rd phalange (p.f.)
13 x metatarsal proximal (p.f.)
12 x metatarsal shaft frags.
5 x metacarpal proximal (p.f.)
3 x metacarpal shaft frags.
6 x metapodial distal frags. (d.f.)
2 x metapodial distal epiphysis (d.u.)
L. mandible frag. -P3P4M1/

L. mandible frag.	/M1M2
L. mandible frag.	/M3
L. mandible frag.	/M3
R. mandible frag.	P2P3P4M1/
R. mandible frag.	/M2M3
R. mandible frag.	/--M/
R. mandible frag.	/M3
L. maxilla frag.	/MM/
maxilla frag.	/M/

Pig.

R. scapula (p.f.)
1st phalange (p.u.,d.u.)

Seal.

3 loose teeth

R. humerus distal (d.u.) Grey Seal (? HALICHOERUS GRYPUS)
phalange (p.f.,d.f.)

phalange distal (d.f.) (burnt)

R. mandible frag. cPPP juvenile Grey Seal (HALICHOERUS GRYPUS)

Lagomorphs.

A few bones of rabbit (ORYCTOLAGUS CUNICULUS).

Otter and Badger.

An articulated skull and mandibles of Badger (MELES MELES), and a few bones and mandibles from at least two Otters (LUTRA LUTRA).

Whale.

An unidentifiable frag. of whale bone.

Fish.

Identified species are:

Ballan Wrasse (LABRUS BERGYLTA) (1 frag)

Conger Eel (CONGER CONGER) (1 frag.)

Ling (MOLVA MOLVA) (10 frags.)

Cod (GADUS MORHUA) (1 frag.)

Birds.

A few bones (at most) of:

Shag (PHALACROCORAX ARISTOTELIS)

Cormorant (PHALACROCORAX CARBO)

Guillemot (URIA AALGE)

Puffin (FRATERCULA ARCTICA)

Fieldfare (TURDUS PILARIS)

Redshank (TRINGA TOTANUS)

Kittiwake (RISSA TRIDACTYLA)

Raven (CORVUS CORAX)

Goosander (MERGUS MERGANSER)

Red-throated Diver (GAVIA STELLATA)

Beaker V/VI.

Sheep.

39 x loose teeth
L. scapula frag.
R. scapula (p.u.) (neo-natal)
L. femur proximal (p.f.)
L. femur distal (d.f.)
L. femur shaft frag.
R. femur shaft frag.
L. radius proximal (p.f.)
L. radius shaft frag.
metatarsal shaft frag.
metapodial distal epiphysis frag. (d.u.)
R. astragalus
R. astragalus (neo-natal)
R. calcaneum (d.f.)
R. calcaneum (d.u.)
carpal/tarsal
R. innominate frag. (ilium/ischium)
R. innominate frag. (ilium/ischium)
L. innominate frag. (pubis)
1st phalange (p.u.) (neo-natal)
1st phalange distal
2nd phalange (p.f.)

Cattle.

48 x loose teeth
scapula frag.
R. tibia distal (d.f.)
L. calcaneum frag.
R. calcaneum frag.
1st phalange (p.u.)
1st phalange proximal frag. (p.f.)
2nd phalange (p.f.)
2nd phalange (p.u.)
6 x carpals/tarsals
R. mandible --p4M1M2M3 (M3 erupting)

Red Deer.

6 x loose teeth
L. humerus distal (d.f.)
L. ulna frag.
L. radius proximal (p.f.)
L. femur shaft
L. tibia distal (d.u.)
metacarpal proximal frag. (p.f.)
2 x metacarpal shaft frags.
metacarpal distal frag. (d.f.)
metatarsal shaft frag.
2 x 1st phalange (p.u.)
1st phalange proximal (p.f.)
2nd phalange (p.u.)
2nd phalange distal

3rd phalange (p.u.) (neo-natal)
carpal/tarsal

Pig.

L. humerus distal (d.f.)

Horse

loose tooth

Dog.

A single tooth of domestic dog (CANIS FAMILIARIS).

Seal.

metapodial (p.f.,d.f.)

phalange (p.u.,d.f.)

Lagomorphs and Rodents.

A few bones of rabbit (ORYCTOLAGUS CUNICULUS) and of
house mouse (MUS MUSCULUS).

Fish.

Fragments of fish bone were unidentifiable to species.

Birds.

A few bones of:

Shag	(<u>PHALACROCORAX ARISTOTELIS</u>)
Cormorant	(<u>PHALACROCORAX CARBO</u>)
Gannet	(<u>SULA BASSANA</u>)
Great Auk	(<u>ALCA IMPENNIS</u>)
Guillemot	(<u>URIA AALGE</u>)
Puffin	(<u>FRATERCULA ARCTICA</u>)
Little Auk	(<u>ALLA ALLE</u>)
Stork	(<u>CICONIA CICONIA</u>)

Iron Age II.

Sheep.

9 x loose teeth

R. scapula frag.

R. humerus proximal (p.u.)

R. humerus shaft frag.

2 x L. humerus shaft frags.

L. radius distal epiphysis (d.u.)

R. radius shaft frag.

L. femur proximal (p.u.)

L. tibia shaft frag.

L. metacarpal proximal (p.f.)

3 x R. metacarpal proximal (p.f.)

2 x metacarpal shaft frags.

L. metatarsal proximal (p.u.) (neo-natal)

metapodial distal frag. (d.f.)

R. innominate frag. (ischium)

L. mandible P2P3P4M1M2M3

Cattle.

3 x loose teeth
L. scapula frag. (p.f.)
R. humerus distal (d.f.)
L. tibia proximal (p.f.)
2 x R. radius/ulna (p.f.)
L. radius/ulna (p.f.)
R. radius/ulna frag.
L. ulna (neo-natal)
L. radius (p.u.,d.u.) (neo-natal)
L. metacarpal proximal (p.f.)
L. metacarpal (p.u.,d.u.)
R. metacarpal proximal (p.f.)
metacarpal shaft frag.
metatarsal shaft frag.
2 x L. astragalus
R. astragalus
L. calcaneum (d.f.)
L. calcaneum frag. (d.f.)
2 x L. calcaneum (d.u.) (neo-natal)
2nd phalange (p.u.)
3rd phalange (p.f.)
maxilla frag. /MM/

Red Deer.

4 x L. scapula (p.f.)
8 x R. scapula (p.f.)
3 x L. humerus distal (d.f.)
2 x R. humerus distal (d.f.)
R. humerus distal (d.u.)
2 x humerus distal epiphysis (d.u.)
4 x femur proximal (p.f.)
2 x L. tibia distal (d.f.)
6 x R. tibia distal (d.f.)
5 x tibia distal frags. (d.u.)
L. tibia proximal frag. (p.f.) (burnt)
4 x R. tibia proximal frag. (p.f.)
atlas
atlas frag.
6 x axis frags.
4 x L. radius distal ((d.f.)
2 x L. radius distal (d.u.)
R. radius distal (d.u.)
3 x radius distal frags. (d.u.)
R. radius proximal (p.u.) (neo-natal)
7 x L. radius proximal (p.f.)
5 x R. radius proximal (p.f.)
L. ulna (p.f.)
L. ulna (p.u.)
7 x L. ulna frags.
R. ulna (p.f.)
R. ulna frag.
3 x L. innominate frags. (pubis)
3 x L. innominate frags. (ischium)
L. innominate frag. (acetabulum)

L. innominate frag. (ilium)
 R. innominate frag. (ischium)
 2 x innominate frags. (ilium)
 9 x metacarpal shaft frags.
 R. metacarpal proximal (p.f.)
 metacarpal distal (d.f.)
 7 x metatarsal shaft frags.
 metatarsal shaft frag. (burnt)
 2 x L. metatarsal proximal (p.f.)
 L. metatarsal proximal (p.u.)
 2 x R. metatarsal proximal (p.f.)
 R. metatarsal proximal (p.f.) (burnt)
 2 x metatarsal proximal (p.f.)
 metatarsal proximal frag. (p.f.) (burnt)
 5 x metapodial distal (d.f.)
 4 x metapodial distal epiphysis frags. (d.f.)
 5 x metapodial distal epiphysis frags. (d.u.)
 metapodial distal (d.u.)
 R. lateral malleolus
 8 x 3rd phalange (p.f.)
 2nd phalange (p.fusing)
 2nd phalange (p.f.)
 2 x 2nd phalange (p.u.)
 2nd phalange distal
 5 x 1st phalange (p.f.)
 4 x 1st phalange distal
 1st phalange proximal (p.f.)
 1st phalange proximal epiphysis (p.u.)
 3 x L. calcaneum (d.f.)
 L. calcaneum (d.u.)
 2 x L. calcaneum frags.
 R. calcaneum (d.u.)
 R. calcaneum distal (d.f.)
 2 x R. calcaneum frags.
 12 x L. astragalus
 16 x R. astragalus
 R. astragalus
 14 x carpals/tarsals
 L. patella
 4 x R. patella
 L. mandible frag. P2P3P4/
 L. mandible frag. P2P3P4/
 L. mandible frag. P2P3P4/
 L. mandible frag. P2/ (erupting)
 L. mandible frag. -p3/
 L. mandible frag. /P3p4M1/ (P3 + P4 erupting)
 L. mandible frag. /p3p4-
 L. mandible frag. /P4M1
 L. mandible frag. /M3
 L. mandible frag. /MM/
 L. mandible p2p3p4M1 (p2 + M1 erupting)
 L. mandible - - -M1 (M1 erupting)
 L. mandible frag. /M2M3
 R. mandible frag. /M2M3
 R. mandible frag. -P3P4M1M2/

R. mandible frag. -P3P4M1/
 R. mandible frag. /P4M1
 R. mandible frag. /P4M1M2
 R. mandible frag. - -P4 -/
 R. mandible frag. /-p4M1 (M1 erupting)
 R. mandible -p3 - -
 mandible frag. /M -/
 3 x maxilla frags. /MM/

Seal.

3 x loose teeth
 5 x phalange frags.
 R. scapula frag. (juvenile Grey seal, HALICHOERUS GRYPUS)
 R. ulna frag. (")
 L. ulna frag. (")
 4 x metatarsals (chewed) (Grey Seal, HALICHOERUS GRYPUS)
 L. mandible C--MM/ (Common Seal, PHOCA VITULINA)

Whale.

The three fragments identifiable to species seem closest to Pilot Whale (GLOBICEPHALA MELAENA) and Killer Whale (ORCA GLADIATORIUS).

Fish.

A few fragments of the following species:
 Conger Eel (CONGER CONGER) (2 frags.)
 Cod (GADUS MORHUA) (2 frags.)
Gadoid sp. (2 frags.)

Birds.

Only a bone of Gannet (SULA BASSANA) was identified.

Iron Age I.

Sheep

28 x loose teeth
 L. scapula (p.f.)
 L. radius/ulna (p.f.,d.f.)
 R. radius shaft frag.
 L. humerus (p.f.,d.f.)
 L. humerus distal (d.f.)
 R. humerus distal (d.f.)
 2 x R. humerus distal frags.
 5 x carpals/tarsals
 L. metacarpal (p.f.,d.f.)
 metacarpal shaft frag.
 L. metatarsal (p.f.,d.u.)
 L. metatarsal proximal frag. (p.f.)
 metapodial distal (d.f.)
 metapodial distal epiphysis (d.u.)
 R. tibia proximal (p.u.)
 R. innominate frag. (ischium)
 L. astragalus
 2 x L. calcaneum (d.f.)

3 x 1st phalange (p.f.)
 2nd phalange (p.f.)
 atlas
 L. mandible frag. /p4M1
 R. mandible frag. p2p3p4/
 R. maxilla frag. p2p3/

Cattle

13 x loose teeth
 2 x scapula frags.
 R. scapula frag.
 3 x L. humerus distal (d.f.)
 R. radius proximal (p.f.)
 R. ulna frag.
 L. femur distal frag. (d.f.)
 L. tibia proximal frag. (p.f.)
 2 x L. astragalus
 2 x carpals/tarsals
 R. innominate frag. (ilium/ischium)
 R. innominate frag. (ilium)
 R. calcaneum (d.f.)
 R. metacarpal proximal (p.f.)
 metacarpal shaft frag. (neo-natal)
 metatarsal shaft frag. (")
 metatarsal distal (d.u.)
 3 x L. metatarsal proximal frags. (p.f.)
 2 x R. metatarsal proximal frags. (p.f.)
 metapodial V
 1st phalange distal
 2 x 2nd phalange (p.f.)
 3rd phalange (p.f.)
 R. mandible frag. /M2
 R. maxilla frag. /M/

Red Deer

2 x loose teeth
 R. humerus distal (d.f.0
 R. tibia distal (d.f.0
 R. ulna frag.
 2 x metatarsal shaft frags.
 L. astragalus
 2 x R. astragalus
 2 x carpals/tarsals
 L. mandible frag. /M3

Pig

R. mandible IIC-p2p3p4M1M2

Dog

loose tooth
 L. humerus distal (d.f.)

Horse

3 x loose teeth
 1st phalange (p.f.)

Seal

phalange (p.f.)

R. humerus distal (d.f.) Phoca vitulina (Common Seal)

Whale

Only identifiable frag. was from a Balaenopterid sp.

Fish

The few frags. identified were:

Molva molva (Ling) (1 burnt frag.)

Gadoid sp. (Cod family) (3 frags.)

Birds

Only a single bone of Ciconia ciconia (Stork) could be identified.

Identification of the faunal remains from A'Cheardach Mhor,
South Uist. (S.U.7)

Bay 5 W/87

Sheep

L. tibia distal (d.f.)

Cattle

10 x loose teeth

L. scapula proximal (p.f.)

R. scapula proximal frag. (p.f.)

L. maxilla frag. /P3P4M1M2M3 (P3 and M3 erupting)

Bay 6 W/66

Sheep

R. femur (p.f.,d.f.)

L. humerus (p.f.,d.f.)

2 x atlas

axis

R. horn-core frag.

L. radius (p.f.,d.f.)

L. femur distal (d.f.)

L. scapula (p.f.)

L. scapula frag.

R. innominate

1st phalange (p.f.)

2 x R. tibia (p.f.,d.f.)

L. mandible -P3P4M1M2M3

4 x L. metatarsal (p.f.,d.f.)

R. metatarsal (p.f.,d.f.)

Cattle

1st phalange (p.f.)

2nd phalange (p.f.)

Red Deer

R. calcaneum (d.f.)

Fish

cleithrum frag. Pollachius pollachius (Pollack) cf. 7.260 kg.

Bird

Fulmaris glacialis (Fulmar)

Bay 6 W/95

Sheep

L. femur (p.u.,d.u.)

L. humerus (p.u.,d.f.)

L. humerus (p.u.,f.fusing)

L. radius (p.f.,d.u.)
 R. radius distal (d.f.)
 1st phalange (p.u.)
 L. tibia proximal (p.u.)
 L. tibia shaft frag.
 2 x R. tibia distal (d.u.)
 R. metacarpal (p.f.,d.u.)
 L. metatarsal (p.f.,d.u.)
 2 x R. metatarsal (p.f.,d.u.)
 R. metatarsal proximal

Cattle

R. astragalus	
L. tibia (p.u.,d.u.)	(neo-natal)
R. tibia (p.u.,d.u.)	(")
R. tibia distal (d.u.)	(")
L. femur (p.u.,d.u.)	(")
2 x R. femur (p.u.,d.u.)	(")
2 x L. humerus (p.u.,d.u.)	(")
R. humerus (p.u.,d.u.)	(")
L. radius (p.u.,d.u.)	(")
L. radius proximal (p.u.)	(")
R. radius proximal (p.u.)	(")
L. ulna (d.u.)	(")
2 x metatarsal (p.u.,d.u.)	(")
metatarsal distal (d.u.)	(")
metatarsal shaft frag.	(")
1st phalange (p.u.,d.u.)	(")
2 x 2nd phalange (p.u.,d.u.)	(")
R. calcaneum (d.u.)	(")
2 x L. astragalus	(")

Bay 6 W/66+95

Sheep

5 x loose teeth
 L. scapula (p.f.)
 R. metacarpal (p.f.,d.f.)
 L. mandible p2p3p4M1
 R. mandible frag. -p3p4M1-/
 L. maxilla p2p3p4M1
 L. maxilla frag. -P3P4M1/
 R. maxilla -P3P4M1M2-

Cattle

loose tooth

Pig

loose tooth

Bay 6 W/54

Sheep

2 x loose teeth
horn-core frag.
L. scapula (p.f.) (Cut mark 3)
R. scapula (p.f.) (Cut mark 3)
L. humerus distal (d.f.)
R. humerus distal (d.fusing) (Cut mark 4)
R. femur (p.u.,d.u.)
L. femur proximal (p.u.)
L. radius (p.f.,d.f.)
R. radius distal (d.f.)
R. tibia (p.u.,d.u.)
L. tibia distal (d.u.)
L. tibia distal (d.u.) (Cut mark 8)
L. metacarpal (p.f.,d.f.) (?path. lesion at medial condyle)
R. metacarpal (p.f.,d.f.)
L. metatarsal (p.f.,d.u.)
L. maxilla frag. P4M1M2M3
L. mandible frag. -P3P4M1 (?path. angle of M1)

Cattle

4 x loose teeth
R. mandible p2p3p4 (p4 erupting) (neo-natal)
R. astragalus (")
R. tibia proximal (p.u.) (")
L. humerus (p.u.,d.u.) (")
R. radius distal (d.u.) (")
metatarsal (p.u.,d.u.) (")
metatarsal proximal (p.u.) (")
metacarpal proximal (p.u.) (")
atlas (")
L. mandible frag. (periodontal decay, abscess?)
R. mandible frag. (periodontal decay, premortem loss)

Fish

jaw frag. Gadus morhua (Cod) cf. 90cm.long.
Nid frag.

Bay 7.

Whale

vertebra frag. - large whale cf. Sibbald's Rorqual

Bay 7 W/100

Sheep

L. mandible -p3p4M1 (?abscess)
L. tibia distal (d.f.) (Cut mark 8)
2 x L. metacarpal (p.f.,d.u.)
2 x L. metatarsal (p.f.,d.u.)
L. femur distal epiphysis (d.u.)
L. humerus proximal epiphysis (p.u.)

Cattle

loose tooth
maxilla frag. /MM/
R. metatarsal proximal (p.f.)
R. radius (p.u.,d.u.)
metacarpal shaft frag.
R. femur distal frag. (d.u.)
3rd phalange (p.f.)
R. scapula (p.f.)

Bay 7 in house wall W/93

Cattle

L. mandible P2P3P4M1M2M3

Bay 8 W/73+77

Sheep

R. mandible p2p3p4M1M2 (M2 erupting)
R. mandible -p3p4M1M2
R. mandible frag. /P3P4M1M2
R. mandible p2p3p4M1
R. horn-core
axis (caudal unfused)
L. scapula (p.u.)
R. scapula (p.u.)
2 x 1st phalange (p.f.)
L. tibia (p.u.,d.u.)
R. femur (p.f.,d.f.)
L. femur (p.u.,d.u.)
R. femur proximal (p.u.)
R. femur distal (d.u.)
R. humerus (p.u.,d.fusing)
L. radius (p.f.,d.u.)
R. radius proximal (p.f.)
R. ulna (p.u.)
tarsal
R. metatarsal (p.f.,d.f.) (osteophytes at proximal)
R. metatarsal proximal (p.f.)
L. metatarsal proximal (p.f.)
R. metacarpal (p.f.,d.f.) (osteophytes down shaft)
L. metacarpal (p.f.,d.f.)
L. metacarpal proximal (p.f.)
metacarpal distal frag.
L. innominate frag. (ischium) (unfused)
L. innominate frag. (pubis) (unfused)
R. innominate frag. (ilium) (unfused)

Cattle

12 x loose teeth
L. horn-core/skull frags.

skull/horn-core frag.
R. astragalus
L. calcaneum frag. (gnawed at distal)
2 x 2nd phalange (p.f.)
3rd phalange (p.f.)
carpal

Red Deer
antler frag.

Central area W/48

Sheep
L. mandible P2P3P4M1M2M3
L. tibia (p.f.,d.f.)
L. metatarsal (p.f.,d.f.)
sacrum (fused)

F7 Central area Wheelhouse W/47

Sheep
2 x horn-core frags.
atlas
L. femur (p.u.,d.u.)
R. humerus (p.u.,d.f.)
R. tibia (p.u.,d.u.)
L. tibia proximal (p.u.)
L. tibia distal (d.f.)
L. ulna (p.u.)
L. radius (p.f.,d.f.)
2 x L. metacarpal (p.f.,d.u.)
2 x R. metacarpal (p.f.,d.u.)
L. metatarsal (p.f.,d.f.)
L. metacarpal (p.f.,d.f.)
2 x R. metacarpal (p.f.,d.f.)
L. astragalus
R. astragalus
3 x 1st phalange (p.f.)

Cattle
10 x loose teeth
L. ulna frag.
2 x carpals/tarsals
L. lateral malleolus
1st phalange (p.f.)
2nd phalange (p.f.)
L. tibia (p.u.,d.u.) (neo-natal)
L. humerus (p.u.,d.u.) (")
R. humerus (p.u.,d.u.) (")
femur distal epiphysis (d.u.) (")
L. metacarpal (p.u.,d.u.) (")
R. metacarpal (p.u.,d.u.) (")

R. ulna (p.u.) (")
L. mandible P2P3P4M1

Pig
3 x teeth (p.f.)

Red Deer
loose tooth
tarsal
antler frag.

With whalebone in central post-hole W/90

Cattle
loose tooth
2nd phalange (p.f.)

Pig
R. mandible P1P2P3P4M1M2

Forecourt W/60

Sheep
L. mandible frag. M1M2

Cattle
5 x teeth
L. calcaneum (chewed at distal end)
3rd phalange (p.f.)
1st phalange (p.f.)
2 x 2nd phalange (p.f.)

Pig
L. skull/maxilla frag. -P3P4-M2M3 (periodontal decay at M1 = pre-mort
tooth loss) (cf. RSM 446 Sus scrofa in si
R. maxilla frag. P3P4M1 (cf. RSM 446)

Deer
loose tooth
R. femur distal (d.f.)
tarsal

Bird
L. coracoid -Swan

F6/F7 under wall 2 tumble W/92

Whale
Nid frags.

F7 [10] occupation W/86 PHASE IA

Sheep

almost complete lamb, plus R. maxilla of another lamb of same stage
metacarpal shaft frag.

F8 [10] occupation W/67 PHASE IA

Cattle

horn-core

F7 [10] occupation W/98 PHASE IA

Sheep

3 x loose teeth

L. maxilla frag. p2p3p4

R. astragalus

horn-core frag.

carpal/tarsal

R. tibia distal (d.f.) (Cut mark 8)

Cattle

7 x loose teeth

L. astragalus

2nd phalange (p.f.)

L. ulna frag. (cf. RSM 1905-46 - Shetland cow)

Pig

5 x loose teeth (including "beaded" tusk)

R. maxilla frag. P4M1M2M3 (M3 erupting)

2nd phalange (p.u.,d.u.)

F7 [8][9] W/97 PHASE II

Sheep

R. mandible -p3p4M1 (M1 erupting)

metatarsal (p.u.,d.u.) (neo-natal)

L. radius shaft frag.

Cattle

5 x loose teeth

L. mandible frag. p3p4

L. maxilla frag. MM

carpal/tarsal

R. femur proximal frag. (p.f.)

L. radius distal (d.f.)

L. innominate frag. (ilium/pubis)

4 x 1st phalange (p.f.)

Pig

L. mandible frag. ---M2M3

Deer
antler frag.

Whale
Nid frag.

Dog
L. radius distal - very large (cf. retriever size?)

Bird
Nid frag.

F6 [8] grey sand W/72

Whale
vertebra

F9 [7] blown sand W/65+55 PHASE IV

Sheep
2 x loose teeth
2 x horn-cores
L. femur (p.u.,d.u.)
R. maxilla frag. MM
3 x L. metacarpal (p.f.,d.u.)
L. metatarsal (p.f.,d.u.)
R. metatarsal (p.f.,d.u.)
L. innominate
2 x 1st phalange (p.f.)

Cattle
23 x loose teeth
L. mandible frag. p2p3p4
R. mandible frag. p2p3p4
L. mandible frag. - -p4
L. mandible frag. P2 - -
L. mandible frag. - - - - (P4-M3 erupted but missing)
horn-core/skull frag.
R. metatarsal (p.f.,d.f.) (eroded)
metatarsal (p.u.,d.u.) (neo-natal)
L. metacarpal (p.f.,d.u.)
2 x metapodial distal (d.f.)
R. radius distal (d.f.)
2 x R. astragalus
3rd phalange (p.f.)
2nd phalange (p.f.)
1st phalange (p.f.)

Pig
2 x loose teeth (including "beaded" tusk)
L. mandible frag. M2M3
L. tibia distal (d.f.)

Deer

3 x antler frags.

L. mandible frag. P2P3P4M1

R. calcaneum (d.f.) (slightly larger than RSM 1981-68)

R. calcaneum frag. (" " " " ")

Fish

Nid frag.

Bird

Nid frag.

F7 [7] blown sand W/53+64+78 PHASE IV

Sheep

loose tooth

R. mandible - -P4M1M2M3 (uneven wear on P4, M1 and M2)

L. mandible -p3p4M1M2

L. mandible frag. -p3p4

L. radius (p.f.,d.f.)

L. ulna (p.f.)

R. radius (p.f.,d.u.)

R. femur distal (d.f.)

L. femur distal epiphysis (d.u.)

horn-core frag.

1st phalange (p.u.)

Cattle

20 x loose teeth

L. mandible frag. - - - - (P2-M1 erupted but missing)

R. mandible frag. P2 -

R. mandible frag. p4M1 (M1 erupting)

mandible frag. p4

2 x L. scapula frags.

horn-core

atlas frag.

axis frag.

R. femur proximal (p.f.)

R. humerus shaft frag.

R. ulna frag.

R. innominate frag. (ischium)

R. innominate frag. (ilium)

2 x metapodial distal (d.f.)

R. metacarpal proximal (p.f.)

R. metatarsal proximal (p.f.)

L. metatarsal proximal (p.f.)

metacarpal frag. (d.u.) (diaphysis split)

3 x metacarpal (p.u.,d.u.) (neo-natal)

metapodial distal epiphysis (d.u.)

2 x carpals/tarsals

2 x R. calcaneum (d.f.)

2 x 1st phalange (p.f.) (eroded)

2 x 2nd phalange (p.f.)

femur distal epiphysis (neo-natal)
humerus distal epiphysis (")
1st phalange (p.u.,d.u.) (")
ulna (p.u.) (")
calcaneum (d.u.) (")

Pig

tusk (not-"beaded")

Deer

2 x loose teeth
L. metacarpal proximal (p.f.)
R. radius proximal (p.f.)

Horse

R. metacarpal proximal (p.f.) (cf.RSM 1907-52 "Celtic pony")

Fish

vertebra - Gadoid sp.

F1 [6] W/59

Sheep

R. humerus distal (d.f.) (Cut mark 4)
L. metacarpal (p.f.,d.f.)
metacarpal distal (d.f.)

Cattle

L. radius proximal (p.u.) (neo-natal)
R. humerus distal frag. (d.f.) (Cut mark 5)

Seal

R. humerus (p.u.,d.u.) Halichoerus grypus (Grey Seal)

F2 [6] brown earth W/83

Sheep

L. humerus distal (d.f.)
femur distal (d.u.)
L. humerus proximal (p.f.)
vertebra

Cattle

loose tooth
R. tibia proximal (p.f.) (Cut mark 11)
axis frag.
R. ulna (p.f.)
L. radius proximal (p.u.) (neo-natal)

Deer

antler frag.

R. humerus proximal (p.f.)
R. humerus distal (d.f.)
R. radius distal (d.f.)

Small mammals

R. humerus proximal Lutra lutra (Otter)

G7 [5] level of dark bands PHASE III

Sheep

L. mandible frag. M2
R. maxilla frag. MM
R. calcaneum (d.u.)
L. astragalus
R. astragalus

Cattle

19 x loose teeth
R. mandible frag. -P4M1
2 x 1st phalange (p.f.)
R. astragalus
2nd phalange (p.f.)
R. tibia distal (d.f.)

Pig

3 x loose teeth
R. humerus distal (d.f.)
3rd phalange (p.f.)

Deer

antler frag.
metatarsal distal (d.f.)

Dog

R. maxilla frag. - -P3P4M1M2M3 (cf. small terrier size?)

E6 [5] W/51 PHASE III

Sheep

horn-core

Cattle

2 x loose teeth
2 x 2nd phalange (p.f.)
R. tibia distal (d.f.)

Pig

loose tooth
R. mandible frag. -M3

Deer

L. scapula (p.u.)
L. humerus distal (d.u.)

G6 [5] dark band W/89 PHASE III

Cattle

L. scapula proximal (p.f.)
R. humerus distal (d.f.)
L. astragalus
1st phalange (p.f.)
skull frags.

Pig

R. humerus distal (d.f.)

F8 [4A] brown sand W/85

Cattle

2 x loose teeth
axis frag. (caudal unfused)
R. tibia proximal (p.fusing) (Cut mark 11)
R. humerus proximal epiphysis frag. (p.u.)
R. radius distal epiphysis (d.u.)
L. calcaneum (d.u.)
1st phalange (p.f.)
2nd phalange (p.f.)
3rd phalange (p.f.)

Fish

Nid frag.

H9 [4] occupation W/96

Sheep

loose tooth
axis (caudal)
L. scapula (p.f.)
R. innominate frag. (ilium)
R. mandible -p3p4M1
R. femur (p.u.,d.u.)
L. ulna frag.
R. radius (p.f.,d.f.)
L. radius proximal (p.f.)
L. humerus distal (p.f.)
L. humerus proximal (p.u.)
L. femur distal (d.f.)
R. astragalus
R. calcaneum (d.f.)
L. skull frag.

Cattle

5 x loose teeth

carpal

1st phalange (p.f.)

R. mandible frag. p2p3p4

L. mandible frag. p2p3p4

L. radius distal frag. (d.f.)

L. scapula (p.u.)

(neo-natal)

R. scapula (p.u.)

(")

L. humerus (p.u.,d.u.)

(")

R. humerus (p.u.,d.u.)

(")

L. femur (p.u.,d.u.)

(")

R. femur (p.u.,d.u.)

(")

L. femur distal (d.u.)

(")

L. tibia (p.u.,d.u.)

(")

R. tibia (p.u.,d.u.)

(")

L. ulna (p.u.)

(")

R. ulna (p.u.)

(")

L. astragalus

(")

R. astragalus

(")

L. calcaneum (d.u.)

(")

R. calcaneum (d.u.)

(")

L. radius (p.u.,d.u.)

(")

R. radius (p.u.,d.u.)

(")

L. metacarpal (p.u.,d.u.)

(")

R. metacarpal (p.u.,d.u.)

(")

L. metatarsal (p.u.,d.u.)

(")

R. metatarsal (p.u.,d.u.)

(")

1st phalange (p.u.,d.u.)

(")

2nd phalange (p.u.,d.u.)

(")

L. innominate frag. (ischium)

(")

R. innominate frag. (ilium/ischium)(unfused) (")

Red Deer

antler frag.

Pig

L. astragalus

G6,7,8 [4] stained sand W/81

Sheep

2 x loose teeth

R. innominate frag. (ilium/ischium)

R. innominate frag. (ilium) (unfused)

R. scapula frag.

Cattle

5 x loose teeth

L. femur shaft frag.

femur proximal frag. (p.f.)
R. astragalus (neo-natal)
R. radius distal (d.u.)
R. calcaneum frag.
metapodial distal (d.f.)
metapodial distal frag. (d.f.) (split)
metapodial distal epiphysis (d.u.)
metatarsal proximal frag. (split)
2nd phalange (p.f.)
3rd phalange (p.f.)

Pig

3rd phalange (p.f.)
R. ulna frag.
R. innominate frag. (pubis)

Red Deer

antler tine
1st phalange proximal (p.f.)

Horse

loose tooth

Whale

Nid frag. (burnt)

E6 [4] W/102

Cattle

R. radius proximal (p.f.)
carpal/tarsal

Pig

R. mandible frag. /- - -M2M3
R. tibia distal (d.f.)
R. metacarpal III (d.f.)

Red Deer

antler frag.
R. astragalus

Horse

loose tooth

E4 among large stones W/68

Whale

skull frag. - large whale eg. Rorqual
2 x nid frags.

F4 below [3] among stones W/52

Sheep

loose tooth

R. radius proximal (p.f.)

R. humerus distal (d.f.)

L. metatarsal (p.f.,d.u.)

R. metacarpal (p.f.,d.f.)

Cattle

2 x R. mandible frags.

L. mandible frag.

L. scapula proximal (p.f.)

R. femur proximal (p.f.)

R. metacarpal (p.f.,d.u.)

L. astragalus

L. humerus distal (d.f.)

R. maxilla frag. /P3P4M1M2

Pig

3rd phalange (p.f.)

L. metatarsal III (p.f.,d.u.)

loose tooth - upper canine - probably from juvenile male

Red Deer

R. mandible frag. /P3P4 -M2M3

L. humerus distal (d.fusing)

L. tibia distal (d.f.)

Dog

L. ulna - medium-sized dog

E4 below [3] W/71

Sheep

loose tooth

metacarpal distal (d.f.)

L. radius proximal (p.f.)

L. tibia distal (d.f.) (Cut mark 8)

Cattle

3 x loose teeth

R. mandible frag. /M3 (erupting)

L. maxilla frag. /M1M2M3

L. radius proximal (p.f.)

2 x 1st phalange (p.f.) (one with extensive osteophytes at proximal)

Red Deer

antler tine

R. metacarpal proximal (p.f.)

metacarpal distal (d.f.)

Bird

nid frag.

E7 [3A] dark earth W/61

Sheep

loose tooth

R. mandible frag. /-p3 -M1

Cattle

loose tooth

3 x L. astragalus

2 x R. astragalus

carpal (chewed)

calcaneum frag.

3rd phalange (p.f.)

tarsal

L. metatarsal proximal (p.f.)

Red Deer

loose tooth

2 x carpals

R. calcaneum (d.f.)

L. mandible frag. -p3p4M1/

L. mandible frag. -p3p4M1/

F4 [3A] W/99

Sheep

2 x loose teeth

L. mandible P2P3P4M1M2 -

L. calcaneum (d.f.)

Cattle

5 x loose teeth

L. astragalus

1st phalange (p.f.)

2nd phalange (p.f.)

R. radius proximal (p.f.)

R. calcaneum (d.u.) (neo-natal)

2nd phalange (p.u.) (")

Pig

2nd phalange (p.u.)

Red Deer

L. calcaneum frag. (slightly gnawed at distal) (cf. RSM 1981-68)

F9 [3] blown sand Finds No.283 PHASE V

Human

L. mandible frag. /--M3

G9 [3] blown sand W/57+84 PHASE V

Cattle

7 x loose teeth

2 x R. femur distal (d.f.) (1 x Cut mark 9)

R. humerus distal (d.f.) (Cut mark 5)

metapodial distal (d.f.)

2nd phalange (p.f.)

carpal

Red Deer

antler frag.

2 x loose teeth

Horse

R. femur distal (d.f.) (cf. RSM 1907-52 'Celtic pony')

L. astragalus (slightly smaller than " ")

L. metacarpal III (p.f.,d.fusing)

L. metacarpal II (p.f.,d.fusing)

tarsal

Whale

atlas/axis + 3 x cervical vertebrae cf. Grampus griseus (Risso's Dolphin)
(cf. RSM 1956-36-67)

G [3] blown sand W/74 PHASE V

Sheep

R. scapula (p.f.)

1st phalange (p.f.)

R. metacarpal (p.f.,d.u.)

L. metacarpal (p.f.,d.f.)

L. metatarsal (p.f.,d.f.)

Cattle

3 x loose teeth

R. maxilla frag. /M1M2M3

L. scapula (p.f.)

L. scapula proximal (p.f.)

tarsal

R. tibia distal (d.f.)

Pig

3rd phalange (p.f.)

Red Deer

patella frag.

Whale

radius or ulna distal frag. - large whale eg. Rorqual

H9 [3] blown sand W/94 PHASE V

Sheep

L. humerus (p.f.,d.f.)
R. scapula frag.

Cattle

4 x loose teeth
L. radius proximal (p.f.)
R. tibia distal (d.f.) (Cut mark 11)
R. femur distal (d.f.) (Cut mark 9)
R. metacarpal (p.f.,d.f.)
2 x R. astragalus
L. calcaneum (d.f.)
3 x 2nd phalange (p.f.)
R. maxilla frag. -P3/

Pig

loose tooth
R. maxilla frag. _P2P3P4/

Red Deer

antler frag.

Whale

nid frag.

E7 [3] W/63 PHASE V

Cattle

4 x loose teeth
maxilla frag. /M/
R. astragalus
L. metacarpal proximal (p.f.) (Cut mark 12)
2nd phalange (p.f.)
3rd phalange (p.f.0

F3 [3] W/101 PHASE V

Cattle

atlas frag.
2 x carpals/tarsals

Pig

R. tibia distal (d.f.)

Red Deer

antler frag.
R. humerus distal (d.f.) (slightly larger than RSM 1981-68)

C12 [3] W/88 PHASE V

Sheep

R. scapula (p.f.)

Cattle

7 x loose teeth

L. humerus (p.u.,d.u.) (neo-natal)

Pig

mandible frag. /P4M1

Horse

4 x loose teeth

R. mandible frag. P1P2/ (abscesses at P1?)

R. metatarsal IV

metapodial distal epiphysis (d.u.)

H8 [3] blown sand W/50 PHASE V

Cattle

2 x loose teeth

L. astragalus

metacarpal distal (d.f.)

R. humerus distal (d.f.) (Cut mark 5)

Horse

R. astragalus (slightly larger than RSM 1907-52 'Celtic pony')

J9/H9 [3] blown sand W/82 PHASE V

Cattle

4 x loose teeth

horn-core

L. metacarpal proximal (p.f.) (Cut mark 12)

skull frag.

L. astragalus

1st phalange (p.f.)

L. scapula proximal (p.f.)

L. humerus distal (d.f.) (Cut mark 5)

Red Deer

antler frags. including cast burr

Whale

nid frag.

C9 [2][3] sub-humus W/76

Sheep

metatarsal (p.f.,d.f.)

tarsal
L. astragalus

Cattle

10 x loose teeth
horn-core frags.
R. maxilla frag. /p4M1M2M3 (P4 erupting under p4)
skull frag.
R. scapula proximal (p.f.)
L. humerus distal (d.f.)
L. radius distal (d.f.)
R. radius distal frag. (d.f.)
L. calcaneum (d.f.)

Pig

R. mandible frag. /-P4M1M2M3
L. maxilla -P2P3P3M1

Red Deer

antler frag.
R. scapula proximal (p.f.)
R. calcaneum (d.f.) (cf. RSM 1981-68)

Horse

2 x loose teeth
L. humerus proximal (p.f.) (cf. RSM 1907-52 'Celtic pony')

G8 [2A] W/62

Sheep

R. metacarpal (p.f.,d.f.)
L. metatarsal (p.f.,d.f.)

Cattle

3 x loose teeth
L. mandible p2p3p4M1 (M1 erupting)
carpal
L. calcaneum (d.f.)
R. tibia proximal (p.f.)

J8 [2A] dirty sand W/80

Sheep

loose tooth
skull frag.

Cattle

6 x loose teeth
1st phalange (p.f.)
2nd phalange (p.f.)
R. astragalus
L. femur distal frag. (d.f.)

R. femur distal frag. (d.f.)
R. tibia proximal epiphysis (p.u.)
R. scapula frag.
metatarsal proximal frag. (p.f.)
metacarpal proximal frag. (p.f.)
R. calcaneum frag.

Pig

1st phalange (p.u.,d.u.) (neo-natal)

Red Deer

antler frag.

H8 [2A] hearth II W/69

Cattle

2nd phalange (p.f.)
R. scapula (p.f.)
R. ulna (p.u.)

Pig

3 x loose teeth
R. mandible P2P3P4M1M2M3

Red Deer

antler frags.

F9/E9 [2] W/49

Sheep

L. scapula (p.f.)
L. tibia distal (d.f.) (Cut mark 8)
L. mandible p2p3p4M1M2

Cattle

loose tooth
L. metacarpal proximal (p.f.) (Cut mark 12)
metapodial distal (d.f.) (Cut mark 12)
R. radius proximal (p.f.)
R. tibia distal (d.f.) (Cut mark 11)
L. scapula frag. (p.f.)
R. innominate frag. (ilium)
L. innominate frag. (acetabulum) (fused) (cf. RSM 1905-46 'Shetland cov

Pig

R. humerus (p.u.,d.f.)

G6/7 [2] W/58

Cattle

5 x loose teeth
1st phalange (p.f.)
2nd phalange (p.f.)
R. patella
R. femur distal (d.f.)
R. ulna (p.f.)

F7/8 baulk down to upper stone level. blown sand W/56

Cattle

2 x loose teeth
L. scapula (p.f.) (Cut mark 3)
R. scapula (p.f.)
R. astragalus
R. metatarsal (p.f.,d.f.)
1st phalange (p.f.)
2nd phalange (p.f.)

Red Deer

antler frag.

Horse

1st phalange (p.f.,d.f.) (slightly longer and slimmer than RSM 1907-52

G/F blown sand W/75+79

Sheep

loose tooth

Cattle

6 x loose teeth
L. mandible p2p3p4M1 (M1 erupting)
L. mandible P2P3P4M1M2M3
2 x horn-core frags.
R. scapula (p.f.)
R. metatarsal proximal (p.f.)
2 x metapodial distal (d.f.)
1st phalange (p.f.)
2 x 2nd phalange (p.f.)

Pig

2 x loose teeth

Red Deer

antler frags.

Human

fibula frag.

Unstratified

Whale

4 x vertebrae frags. - large whale cf. Rorqual

vertebral spinous process - very large whale cf. Sibbald's Rorqual

rib and skull frag. - medium/large whale cf. Bottle-nosed Whale (cf. R.
Turner Collection, C.H.r.4)

nid frags.

Identification of the faunal remains from A'Cheardach Bheag,
South Uist. (S.U.10)

Wheelhouse I.

GENERAL CONTEXTS W/158/159/140/167

Sheep

3 x loose teeth
axis (caudal ep.u.)
L. scapula proximal (p.f.)
L. tibia (p.f.,d.f.)
L. tibia (p.u.,d.u.)
L. tibia distal (d.u.)
R. tibia (p.f.,d.f.)
L. calcaneum (d.u.)
L. femur (p.u.,d.u.)
L. femur proximal (p.f.)
L. humerus (p.u.,d.fusing)
L. astragalus
1st phalange (p.f.)
L. mandible p2p3p4M1
R. mandible frag. --p4M1/

Cattle

4 x loose teeth
atlas
L. scapula proximal frag. (p.f.)
R. scapula proximal frag. (p.f.)
femur distal epiphysis (d.u.) (neo-natal)
radius/ulna shaft frag.
L. tibia shaft frag.
L. metacarpal (d.u.)
metapodial distal frag. (d.u.)
2 x 2nd phalange (p.f.)
3rd phalange
L. mandible p2p3p4M1
R. mandible frag. /p4/

Red Deer

2 x loose teeth
L. tibia distal (d.f.)
tarsal
antler frags.

Whale

axis frag. cf. Balaenoptera acuto rostrata (Lesser Rorqual)
burnt and unburnt frags.

FALLEN STONES W/107

Sheep

L. radius/ulna proximal (p.f.)

Red Deer
burnt antler frag.

Dog
R. radius and ulna, atlas, vertebra and 4 x ribs of small dog cf. s
terrier?

CENTRAL AREA W/112/105/113/126/131

Sheep
loose tooth
R. metatarsal proximal (p.f.)

Cattle
loose tooth
L. scapula (p.u.)
L. humerus distal (d.f.)
metatarsal proximal (p.u.) (neo-natal)

Pig
2 x loose teeth

Red Deer
3 x loose teeth
antler frags

Whale
burnt frags.

HEARTH W/117/124/134

Cattle
2 x loose teeth
L. ulna frag.
2nd phalange (p.f.)

Red Deer
L. mandible -P3P4M1M2M3
L. mandible frag. P2P3P4M1-/
L. mandible frag. P2P3P4M1-/
L. mandible --P4M1M2M3 (periodontal decay)
R. mandible -P3p4M1M2M3
R. mandible -p3p4-
R. mandible frag. /M2/
50 x loose teeth
many mandible and tooth frags.

Whale
vertebra frag. cf. Hyperoodon rostratus (Bottle-nosed Whale)

BAY I W/121/111

Sheep

loose tooth
tibia shaft frag.
R. mandible frag.

BAY II W/119/141

Pig

loose tooth

Whale

burnt frags.

BAY IV W/108/109/110

Sheep

horn-core
R. innominate

Cattle

4 x loose teeth
R. scapula frag. (p.f.)

Pig

R. humerus shaft frag.

Red Deer

antler frag.

Whale

burnt frags.

Human

? fibula frag.

AISLE - BAY V-IV - JUST UNDER TURF

Sheep

limb bones and vertebrae of at least 2 young animals, probably
just under 1 year old

Bird

tibiametatarsal - Anser sp. (Goose)

Bay V

Nid frags only

BAY VI W/136/161

Sheep

R. tibia proximal (p.u.)

Whale

frag.

BAY VII W/128

Sheep

R. mandible -p3p4M1M2

L. innominate

Cattle

tooth frag.

Red Deer

antler frag.

Dog

R. metatarsal (p.f.,d.f.) - medium-sized dog

BAY VIII W/160

Whale

Nid frag.

Entrance complex to Wheelhouse I

TOP OF WALLING W/104/122

Sheep

2 x loose teeth

Cattle

2 x loose teeth

R. astragalus

metacarpal (p.u.,d.u.) (neo-natal)

Pig

R. maxilla frag. /-P4M1

Seal

R. ?tympanic bone Halichoerus grypus (Grey Seal)

Bird

tibio-tarsal distal - Anser sp. (Goose)

AMONG STONES W/120

Cattle

2 x loose teeth

WITHIN CIRCLE OF STONES W/118

Sheep

metatarsal frag.

Cattle

axis

Fish

cranial frag. Gadoid sp.

PASSAGE SAND W/103

Sheep

loose tooth

Pig

2 x tusks

OUTSIDE WHEELHOUSE WALL W/115

Cattle

metapodial distal (d.u.)

Wheelhouse II.

W/106/129/130/132/114/135/127

Sheep

2 x loose teeth

R. scapula frag.

L. femur (p.u.,d.u.)

L. metacarpal (d.u.)

R. mandible p2p3p4M1-

R. mandible p2p3p4M1

Cattle

4 x loose teeth

L. tibia shaft frag.

L. radius distal (d.f.)

R. radius distal (d.f.)

metapodial distal frag. (d.u.)

1st phalange (p.f.) (?path?)

Red Deer

antler frags.

Dog
L. ulna - cf small terrier

INSIDE FURNACE W/157

Red Deer
R. mandible ---M1M2-

UNSTRATIFIED W/165/166/168

Whale
burnt and unburnt frags.

SURFACE CLEARANCE W/142

Sheep
2 x loose teeth
R. tibia distal (d.f.)
L. radius (p.f.,d.f.)
R. astragalus (burnt)
L. mandible -p3p4M1
L. mandible p2p3p4M1
R. mandible p2p3p4M1

Cattle
5 x loose teeth
R. TC+4 fused with R. T2+3

Pig
maxilla frag. /-m-/

Red Deer
tarsal

Whale
Nid frag.

Fish
Nid frag.

Identification of the faunal remains from miscellaneous
sites in South Uist and Benbecula.

South Uist 8.

Sheep.

2 x loose teeth
L. scapula frag. (p.f.)
R. scapula frag. (p.f.)
L. humerus frag.
R. tibia distal (d.u.)
metatarsal shaft frag.
R. mandible frag. -p3p4/

Cattle.

6 x loose teeth
atlas frag.
axis frags.
L. scapula frag. (p.u.)
R. calcaneum frag.
L. ulna frag.
carpal
R. metacarpal proximal frag. (p.f.)
R. mandible frags. (ascending ramus)

Red Deer.

2 antler frags. (worked tine and burnt frag.)

Pig.

radius frag.

Bird.

R. humerus distal frag. Sula bassana (Gannet).

Lagomorphs.

tibia distal - Oryctolagus cuniculus (Rabbit)

South Uist 9.

Sheep.

13 x loose teeth
atlas
L. humerus (p.f.,d.f.)
L. humerus frag.
R. humerus frag.
L. radius (p.f.,d.f.)
L. radius frag.
L. femur distal (d.f.)
R. femur proximal (p.f.)
R. femur distal (d.f.)
R. femur distal (d.u.)
R. scapula frag. (p.f.)

L. tibia proximal (p.f.)
 L. tibia distal (d.f.)
 R. metatarsal (p.f.,d.f.)
 carpal/tarsal
 L. innominate frag. (ilium)
 L. innominate frag. (ischium)
 L. mandible -p3p4M1M2
 L. mandible -p3p4M1
 L. mandible p2p3p4M1
 L. mandible frag. -P3P4M1/
 mandible frag. -P3- M1M2M3
 R. mandible frag. -p3-/
 L. maxilla frag. P2P3P4/

Cattle.

56 x loose teeth
 3 x atlas frags.
 femur proximal epiphysis (p.u.)
 L. femur proximal (p.f.)
 L. femur proximal (p.u.)
 L. femur distal (d.f.)
 L. humerus distal frag. (d.f.)
 R. humerus distal (d.f.)
 radius/ulna shaft frag. (fused)
 L. radius proximal frag. (p.f.)
 R. radius proximal frag. (p.f.)
 L. astragalus (neo-natal)
 3 x L. calcaneum (d.u.)
 R. calcaneum frag. (d.f.)
 3 x carpals/tarsals
 2 x 1st phalange (p.f.)
 4 x 2nd phalange (p.f.)
 2nd phalange (p.f.) (burnt)
 3 x 3rd phalange (p.f.)
 R. innominate frag. (ischium)
 innominate frag.
 horn-core
 horn-core frags.
 R. metacarpal (p.f.,d.u.)
 2 x L. metatarsal proximal (p.f.)
 R. metatarsal proximal (p.f.)
 metatarsal proximal (p.u.) (neo-natal)
 metapodial distal (d.f.)
 metapodial frag.
 3 x metapodial distal epiphysis frags. (d.u.)
 L. mandible - -P4M1M2M3
 L. mandible frag. p2p3p4/
 L. mandible frag. P2P3p4M1/ (P2 and P3 erupting)
 L. mandible frag. P2/
 L. mandible frag. / - -M2-
 R. mandible frag. p2p3p4M1/
 R. mandible frag. ----/ (P2-M1 erupted but missing)
 mandible frag. /MM/
 mandible frag. /MM/

Red Deer.

loose tooth
femur proximal epiphysis (p.u.)
L. humerus distal (d.f.)
L. humerus frag.
L. radius proximal (p.f.)
R. innominate frag. (ilium/ischium)
1st phalange (p.f.)
2nd phalange (p.f.)
antler frags. including cast burr frag.

Pig.

3 x loose teeth
axis frag.
R. scapula frag. (p.f.)
R. scapula frag. (p.u.)
L. ulna frag. (?dog chewed at olecranon)
R. ulna frag.
R. proximal radius/ulna (p.f.) (fused at proximal)
L. radius proximal frag. (p.f.) (split)
2 x R. humerus frags.
R. humerus distal frag.
L. tibia distal frag. (d.f.)
L. tibia distal (d.u.)
R. tibia frag.
mandible frag. /M/

Horse.

10 x loose teeth
R. humerus (p.f.,d.f.)
R. tibia distal (d.f.)
L. radius distal frag. (d.f.)
L. calcaneum (d.f.) (chewed at distal)
carpal/tarsal
3 x metapodial distal frags. (d.f.) (split longitudinally)
3 x 1st phalanges (p.f.)

Dog.

R. femur and L. mandible ---p4M1M2 - cf. small terrier.

Whale.

Nid frag.

Fish.

vertebra - Gadoid sp.

Bird.

humerus distal - Sula bassana (Gannet)
8 bones of Puffinus puffinus (Manx Shearwater)
femur proximal - cf. Lyrurus tectrix (Black Grouse)
Nid frag.

South Uist 22.

S.U.22/A (W/152)

Sheep.

loose tooth

2 x horn-core

2 x 2nd phalange (p.f.)

R. metacarpal (p.f.,d.u.)

R. metatarsal (p.f.,d.u.)

L. metatarsal (p.f.,d.f.)

R. metatarsal (p.f.,d.f.)

Cattle.

2 x loose teeth

horn-core frag.

L. scapula frag. (p.f.)

metapodial distal (d.f.)

L. calcaneum frag.

Red Deer.

R. calcaneum (d.u.)

Lagomorphs.

femur - Oryctolagus cuniculus (Rabbit)

Bird.

humerus - Turdus philomelos (Song Thrush)

S.U.22/B

Sheep

axis frag.

metacarpal proximal frag. (p.f.)

Cattle

loose tooth

Pig

L. innominate frag. (ischium) (unfused)

S.U.22/C

Sheep.

L. radius (p.f.,d.u.)

R. metacarpal (p.f.,d.u.)

R. metatarsal (p.f.,d.u.)

L. mandible frag. p2p3p4/

R. mandible frag. p2p3p4M1/

Cattle.

2 x loose teeth
axis frag.
L. tibia distal (d.f.)
L. astragalus
L. scapula proximal (p.u.)

Pig.

R. calcaneum (d.u.) (neo-natal)

S.U.22/C hearth

Sheep.

L. mandible frag. p2p3/

Red Deer.

antler frags.

S.U.22/D (W/155)

Sheep.

tooth frag.

Cattle.

loose tooth
2 x L. astragalus
2nd phalange (p.f.)

S.U.22/G (W/154)

Sheep.

L. tibia distal (d.f.)
R. femur shaft frag.

Cattle.

loose tooth

S.U.22 (unspecified)

Sheep.

4 x loose teeth
atlas frag.
L. astragalus
L. scapula frag.
2 x L. radius proximal (p.f.)
L. tibia distal (d.f.)
L. innominate frag. (ischium)
L. humerus frag.
metacarpal distal (d.u.)

metatarsal distal (d.u.)
R. metacarpal (p.f.,d.u.)
L. mandible frag. /-p4-
L. maxilla frag. /p4M1

Cattle.

13 x loose teeth
2 x 1st phalange (p.f.)
2 x 2nd phalange (p.f.)
3rd phalange (p.f.)
atlas frag.
axis frag.
L. scapula proximal (p.f.)
R. scapula frag.
carpal/tarsal
R. calcaneum frag.
humerus proximal frag. (p.f.)
R. humerus frag.
L. innominate frag. (ischium)
2 x metapodial distal frags. (d.f.)
L. metacarpal proximal frag. (p.f.)
metatarsal proximal frag.(p.f.)
L. ulna frag. (p.u.)

Red Deer.

2 x antler frags.
L. scapula proximal (p.f.)
R. scapula proximal (p.f.)
R. calcaneum (d.u.)
2 x 1st phalange (p.f.)
2nd phalange (p.f.)
3rd phalange (p.f.)
R. tibia distal frag. (d.f.)
2 x R. radius distal (d.f.)
2 x metapodial shaft frags.

Pig.

4 x loose teeth (including canine - probably domesticated)
axis
L. scapula frag.
R. scapula frag.
R. tibia proximal epiphysis (p.u.)
R. humerus distal (d.f.)
L. humerus distal (d.u.)
R. humerus distal (d.u.)
R. innominate frag. (ilium)
metapodial proximal (p.f.)
R. mandible frag. ---p2p3/
mandible frag. P1/
L. mandible frag. /P3/

Horse.

2 x loose teeth

Lagomorphs.

several bones of Oryctolagus cuniculus (Rabbit)

Fish.

vertebra - Gadoid sp.

dentary - Pollachius virens (Saithe) cf.107 cm. long

premaxillary - Gadus morhua (Cod) cf.106 cm. long

4 x nid frags.

Bird.

humerus - Alca impennis (Great Auk)

South Uist 24.

Square B.

Sheep.

atlas

atlas frag. (burnt)

L. femur (p.f.,d.u.)

R. femur distal epiphysis (d.u.)

L. tibia (p.u.,d.u.)

R. tibia distal frag. (d.u.) (burnt)

R. radius proximal (p.f.)

L. innominate

R. innominate

4 x L. metacarpal (p.f.,d.f.)

3 x R. metacarpal (p.f.,d.f.)

2 x L. metacarpal proximal (p.f.)

3 x L. metatarsal (p.f.,d.f.)

L. metatarsal proximal (p.f.)

3 x R. metatarsal (p.f.,d.f.)

R. metatarsal (p.f.,d.f.) (slight distortion of diaphysis)

2 x 1st phalange (p.f.)

1st phalange (p.u.)

2nd phalange (p.f.)

3rd phalange (p.f.)

Cattle.

3 x loose teeth

carpal/tarsal

metapodial frag. (worked)

Pig.

R. radius distal epiphysis (d.u.)

R. ulna (d.u.,p.u.)

L. metatarsal III (d.u.)

Square C.

Sheep.

2 x atlas
atlas frag.
axis frag.
L. humerus (p.u.,d.f.)
R. humerus proximal (p.f.)
L. tibia (p.f.,d.f.)
R. tibia proximal (p.f.)
L. tibia distal (d.u.)
L. radius proximal (p.f.)
R. innominate frag. (ilium)
R. innominate frag. (ischium)
L. metacarpal proximal (p.f.)
R. metacarpal (p.f.,d.u.)
R. metatarsal (p.f.,d.u.)
R. metatarsal proximal (p.f.)
2 x L. astragalus (burnt)
2 x L. calcaneum (d.f.) (burnt)
L. calcaneum (d.u.)
20 x 1st phalanges (p.f.) (burnt)
7 x 2nd phalanges (p.f.) (burnt)
4 x 3rd phalanges (p.f.)
1st phalange (p.u.)
10 x carpals/tarsals
L. mandible frag. p2p3p4/

Red Deer.

antler tine

Lagomorphs.

tibia - Oryctolagus cuniculus (Rabbit)

Square D.

Sheep.

9 x loose teeth
skull frags.
horn-core frag.
L. scapula frag.
R. tibia shaft frag.
L. mandible p2p3p4M1M2
R. mandible frag. /p4M1M2 (M2 erupting)
L. mandible p2p3p4M1M2 (single skull?)
R. mandible p2p3p4M1M2 "
L. maxilla frag. /M1M2 "
R. maxilla frag. /M2 "
maxilla frag. /p/ "

Cattle.

R metatarsal proximal (p.f.)
1st phalange (p.u.)
2nd phalange (p.u.)

Red Deer.

antler frags. including skull/antler frag. and 2 x burnt frags.

Lagomorphs.

vertebra - Oryctolagus cuniculus (Rabbit)

Bruach Ban, Benbecula.

Platforms/D 13

Sheep

L. horn-core frag.

L. radius distal (d.u.)

Cattle

R. ulna frag.

metapodial distal (d.f.)

3rd phalange (p.f.)

carpal

R. innominate frag. (ilium)

Red Deer

antler frag.

Whale

2 x nid frags.

Main trench

Cattle

axis frag.

R. scapula proximal (p.f.)

L. scapula proximal (p.f.)

L. tibia proximal frag. (p.f.)

L. astragalus

L. innominate frag. (ilium)

loose tooth

vertebra frag. - chopped through centrum - very weathered

Pig

L. half of skull - split down suture lines

L. mandible frag. /P3P4M1M2M3

R. humerus distal (d.f.)

L. innominate frag. (ilium)

Red Deer

antler frags.

Whale

vertebra epiphysis frag. cf. large whale eg. Rorqual

Main trench - top level W/170

Red Deer

antler frag.

Whale

skull frags. - medium/large whale

mandible frag. - huge whale - nearest in size to Atlantic Right Whale (RSM 1915-86-1)

Square IV W/171

Sheep

metatarsal shaft frag.

Cattle

4 x loose teeth

Red Deer

3rd phalange (p.f.)

antler frags.

Whale

skull frags. - medium/large whale

Unstratified

Sheep

atlas frag.

axis frag.

L. astragalus

R. tibia distal (d.u.)

R. femur distal (d.f.)

R. humerus proximal (p.u.)

L. humerus shaft frag. (chewed)

R. radius (p.f.,d.u.)

L. scapula (p.f.)

R. scapula (p.f.)

R. metatarsal (p.f.,d.f.)

R. metatarsal (p.f.,d.u.)

L. metacarpal proximal (p.f.)

tibia shaft frag. (burnt)

Cattle

4 x loose teeth

carpal/tarsal

maxilla frag. /M/

metatarsal shaft frag.(diaphysis unfused)

L. astragalus (neo-natal)

Red Deer
2 x 2nd phalange (p.f.)
antler frags.

Pig
loose tooth
1st phalange (p.u.)

Bruach a Tuath, Benbecula.

Main section W/269

Sheep
atlas
R. scapula (p.f.)
L. scapula frag.
2 x L. radius shaft frag.
R. innominate frag. (ischium)

Cattle
horn-core frags.
R. scapula (p.f.)

Pig
R. humerus shaft frag.

Main Trench - platform W/240

Cattle
2 x loose teeth

Deer
antler frags.

Bird
Nid frag.

Main Trench - 2nd level

Sheep
L. mandible P2P3P4M1M2M3

Square II - lower level

Cattle
2 x loose teeth
R. mandible frag. /p4M1M2 (M2 erupting)
L. mandible frag. /M2 (M2 erupting)

R. humerus distal (d.u.) (small)
R. femur proximal (p.u.) (small)
patella
rib proximal
atlas frag.
sternal frags. (fused) (cut longitudinally)

Whale

vertebra - cf. Grampus griseus (Risso's Dolphin)
cf. RSM 1956-36-67)

Square I - outside doorway

Sheep

metatarsal (p.f.,d.f.)

Cattle

L. horn-core
maxilla frag. /M/
L. ulna frag.
R. humerus proximal frag. (p.f.)

Square II - from burnt filling of hole 5'west of 37'

Sheep

3 x loose teeth
atlas frag.
axis frag. (burnt)
R. humerus proximal frag. (p.f.) (burnt)
L. tibia shaft frag. (burnt)
L. mandible p2p3p4M1 (Cut mark 12)
L. maxilla -P3P4M1M2M3
R. maxilla frag. /M2M3

Square II - large fork in wall W/198

Sheep

L. scapula frag.
R. metacarpal proximal (p.f.)

Cattle

2 x loose teeth
L. radius distal frag. (d.f.)
L. femur proximal frag. (p.f.)

Square III - stone setting in N wall

Cattle

R. radius (p.u.,d.u.) (neo-natal)
metatarsal (p.u.,d.u.) (neo-natal)

Square III - 2'south of Hearth C

Pig

maxilla frag. /MM/

Square I - unstratified

Sheep

2 x loose teeth

2 x 1st phalange (p.f.)

L. tibia proximal (p.f.)

metatarsal shaft frag.

R. tibia distal (d.u.)

tibia shaft frag.

R. femur distal epiphysis frag. (d.u.)

Cattle

4 x loose teeth

3rd phalange

atlas frag.

R. innominate frag. (ilium) (unfused)

2nd phalange (p.f.)

R. radius proximal (p.f.)

metapodial distal frag. (d.f.)

L. tibia shaft frag.

R. calcaneum frag. (neo-natal)

Pig

2 x tusks ("unbeaded")

Red Deer

antler frags.

Bird

humerus - Turdus philomelos (Song Thrush)

Whale

Nid frag.

Square II - unstratified W/195

Nid frags.

Square III - unstratified W/190

Sheep

3 x loose teeth

axis (caudal unfused)

L. radius proximal (p.f.)

L. metatarsal (p.f.,d.f.)

R. metatarsal proximal (p.f.)

R. metacarpal (p.f.,d.u.)
L. scapula frag.
R. scapula frag. (p.f.)
L. tibia (p.u.,d.u.)
R. tibia proximal (p.f.)
R. calcaneum (d.u.)

Cattle

maxilla frag. /M/
caput femoris (p.u.)
R. femur distal frag. (d.u.)
L. mandible frag. (P2 erupted but missing)
scapula frag.

Red Deer

antler frag. (burnt black)

Bird

carpometacarpal - Sula bassana (Gannet)

Souterrain - lower levels

Sheep

L. metatarsal proximal (p.f.) (associated with bronze pin)

Cattle

R. femur distal frag. (d.u.)

Bird

humerus proximal - Anas sp. (duck)

Souterrain - higher levels

Sheep

thoracic vertebra (caudal u.,cranial u.)
rib

Cattle

loose tooth
horn-core frag. (burnt)
R. ulna frag. (worked into point)

Seal

rib - cf. Halichoerus grypus (Grey Seal)

Unspecified

Cattle

2 x ribs
R. scapula proximal (p.f.)

Whale

skull frags. - cf. Hyperoodon rostratus (Bottle-nose whale)

Unstratified contexts

Sheep

loose tooth

2nd phalange (p.u.,d.u.) (neo-natal)

L. tibia distal epiphysis (d.u.)

Cattle

3 x loose teeth

2nd phalange frag. (p.f.)

Red Deer

antler frags.